REGIONAL SOCIOLOGY

The Century Social Science Series

REGIONAL SOCIOLOGY

BY

RADHAKAMAL MUKERJEE, M.A., PH.D.

PROFESSOR AND HEAD OF THE DEPARTMENT OF ECONOMICS AND SOCIOLOGY, LUCKNOW UNIVERSITY. AUTHOR OF "FOUNDATIONS OF INDIAN ECONOMICS," "PRINCIPLES OF COMPARATIVE ECONOMICS," "DEMOCRACIES OF THE EAST," "BORDERLANDS OF ECONOMICS," ETC.

NEW YORK AND LONDON
THE CENTURY CO.

PRINTED IN U. S. A.

PREFACE

This book is an attempt to present sociology on the basis of a scientific classification of types and regions. The study of the relation between physical and social conditions, inspired by Ratzel's *Anthropogeographie,* has corrected the old partiality for the one straight line in sociology; but no full attempt has been made at the classification of social types, which alone can lay the scientific foundations of Comparative Sociology. No doubt the overbold axioms of Ibn Khaldun, Buckle and Montesquieu and the summary generalizations of Ratzel ranging over diverse peoples and cultures have been superseded by conclusions derived from careful surveys of localized and regional data. The disciples of Ratzel in Germany and those of Vidal de la Blache in France have sought to establish a real science of the relations of man with nature—his relations with the present and with the past; and many brilliant writers have undertaken intensive, meticulous studies of the social characteristics of distinctive regions. They have moved far away from the old geographical determinism and no longer deal with the region as an artificial and preëstablished unity but reduce it into its complex elements in relation to the primordial possibilities of existence. Similarly Ellsworth Huntington has analyzed with great precision the effects of climate and weather on man's character, habits and actions. But these have not touched the mode of treatment of Sociology. Meanwhile, ecological surveys exhibit interrela-

tions between animal and animal and between animal and vegetable life in selected regions and emphasize the regional reference in scientific thinking. These introduce an element of variety into the dullness and monotony of the great natural areas and of the climatico-botanical frames, and enable us to realize that the rôle of man on the surface of the earth is placed in the organic setting of great harmonic vegetable or animal aggregations, which have arrived at a more or less stable equilibrium, and which impose on human society typical manners in which it adapts itself to the varied possibilities of the diverse regions. Already we are glimpsing a Human Ecology, which seeks to provide us with the keys to the origin of diverse social types, correlated with the plant and animal communities of a natural, easily distinguished region. Wherever man depends upon agriculture and has found a permanent abode, the effects of fixation and isolation on institutional forms are far more discernible than where he wanders or, at least, has not established himself in a stable relation of the soil.

Thus for five-sixths of the human race, the growing of different staple crops, such as rice, wheat or Indian corn, and the rearing of different domestic animals, selected from among the native stock of a region, govern not merely man's interests and habits but also his social organization. Sociology here exhibits in the sequence of stages certain fundamental types which are the outcome of the cumulative effects of environment and ecologic succession. But the region which nurtures man is endowed by him with a psychological significance. It becomes at once a natural as well as a cultural entity. For it is also his handiwork and heritage, a repository of tools and weapons, traditions

and mode of life. These serve as a selective agency for social habits and activities, and give man's adjustment the form of a collective and not an individual response, and his evolution the form of increasing complexity of social life.

The significance of the region to man's evolution also changes with man's control of outer nature, his utilization of the constant and durable forces of climate, soil, vegetation and "the living covering." Thus social history cannot be separated from economic history, which gives an account of both man's receptive rôle and his constructive rôle in his relations to the natural regions, which ecology starts with. Of special importance, then, is economic history as a branch of the study of sociology, with its two fundamental bases, an intimate acquaintance with the limits and potentialities of the natural region and a general understanding of the conditions of man's development. Thus, in the same region, the stages of economic development govern the relation of man to land and natural resources and the possibilities of division and organization of labor, and hence different social types. Such a regional treatment of sociology will not only be a preliminary to the classification of social types by the selection of a natural entity as the unit of consideration; it will also emphasize the interweaving of the processes of social adaptation and thus link together the now fragmentary studies of economic history, politics and ethnology in the central inquiry of the genesis and development of social types. It is now a truism that economic development reacts upon social and political conditions. Each stage of economic development nourishes a characteristic political system, a type of domestic organization and a form of property. Similarly, political institu-

tions and forces which are the outcome of economic conditions maintain characteristic economic arrangements and impart to them their peculiar legal forms and social alignments. Thus our disconnected specialized studies cannot progress unless they advance along a common road. But that road is not one, it is diversely ramifying in different regions. In each of these diverse paths which history chalks out on the map of humanity all these sciences which stand between biology and culture must march hand in hand. Thus Regional Sociology will give a more comprehensive classification of social types with reference to their ecology and successive stages, which will harmonize the abstract and disconnected studies of different phases of cultural evolution. It will compare natural classes and types in the light of the history of their development and their stage in that history. Thus, combining the regional and historical methods, Sociology can direct the use of comparison on a somewhat large scale, which is indispensable for its forming concepts and generalizations applicable to all social types and regions. The comparative and regional methods will give sociology classified data and synthetic treatment on a firmer ground of realism, and dismiss many of those vague abstractions which stand in the way of a full understanding of peoples and retard the progress of the science.

I am deeply indebted to Dr. E. A. Ross. He read the book in manuscript and made many helpful criticisms and suggestions. My thanks are also due to George Frankland, Esq., for the reading and editorial supervision he has given to the proofs of this volume.

RADHAKAMAL MUKERJEE.

EDITOR'S INTRODUCTION

It is a privilege to introduce to English readers the first book that has ever appeared under the title *Regional Sociology.* I hope that this felicitous phrase, suggested to our author by the world-famous Indian poet Rabindranath Tagore, will reverberate far and that the field it names will become a recognized and well-tilled province of Sociology.

It is fitting that this first general treatise on the subject (I am not forgetting Le Play and Demolins) should come from the pen of an Asiatic scholar. Nowhere else than in Asia is there such a wealth of material showing how the physical characteristics of the region leave their stamp upon its inhabitants, molding not only their work, customs and institutions, but even their attitudes, morals and character.

I suppose no large population shows so faint and doubtful a response to region as we Americans. Never before were folk of forest or valley, of sea or river delta, so little insulated. Our education, reading matter, films, sports, standardized articles of consumption, religious denominations, trade and professional unions, political parties and common institutions pull us all into a national plane, or at least a sectional plane. We take no sharp imprint from the geographical niche we live and work in. All the more, then, should we realize that the bulk of mankind are creatures of Place and have other needs and tastes than we.

I pity the reader who does not find a charm in Professor

Mukerjee's intimate and sympathetic pictures of Asiatic regional types—rice growers of Java or folk of the Bengal Delta—who never before have been studied by a competent sociologist.

I do not expect these pages to lure Gladys from her chocolates and story book; but I *do* count on their finding favor with serious students of geography, culture and institutions, of sociology, economics, law, ethics and politics.

EDWARD ALSWORTH ROSS

CONTENTS

REGIONAL SOCIOLOGY

REGIONAL SOCIOLOGY

CHAPTER I

THE WEB OF LIFE

Adaptation Varies with Species.—The biological method in sociology rests on the idea of man as the outcome of a long, evolutionary process. It is true that man has achieved control over the forces of Nature, and a firmer foothold in the struggle for existence, than the stock he has emerged from. But even as his physique bears unmistakable marks of his animal apprenticeship in trees and meadows, so his social characteristics reveal, like plant and animal responses, something of the physical features of the region which has built him up. His labors, modes of life and social experiences show, though in a new synthesis, the same adaptation, which is one of the fundamental principles of organic evolution applicable to the different living systems. In the plant world, botanists have abundant evidence for the correspondence of formation of similar plants. While many plant physiologists are yet sceptical concerning the use of such terms as "reaction" of a plant to its habitat, "modification" or "adaptation", careful investigation shows that species do alter their structure under different environmental conditions. Familiar examples are the reduction of leaves, production of water-storing tissue in skin or leaf, thick-walled epidermis, and hairy coating in

desert plants. Not less significant are the breathing roots of mangrove plants as well as their viviparous germination in tropical sea coasts. Plants growing in the rapids develop dissected and ribbon-shaped organs, while those growing in quiet waters show fully-expanded, more or less entire leaves. Similarly, the branching of the trees registers the direction of the prevailing wind. The vegetation of sand dunes or of salt marshes furnishes good instances of plant formations determined by the generally constant soil and climatic condition; other notable examples are aquatic, marsh, fen and moor formations. Plants show by their outward appearance all the characteristics of the climate—the more or less prolonged and powerful action of heat or cold, light or darkness, the wind which bends or stunts or withers them and, above all, drought or humidity. Not less important is the action of the soil, according to its greater or less fertility, its permeability to air and water and its richness in chemical substances, obnoxious or beneficial to calcicole, calcifugous or halophilous plants.[1] Such adaptations must not, however, be supposed to be homologically the same in different species; for, if that were so, all plants which are subject to the same conditions would possess the same structural features even if they belonged to the most widely separated groups. This is only exceptionally true. Experience shows that one species reacts in one way, another species in a different way, to reach analogous adjustments; but that the reaction is often of the same kind in plants belonging to the same phylum. Thus one species protects itself against desiccation solely by means of muci-

[1] See Febvre: *A Geographical Introduction to History*, p. 119; also Schimper: *Plant Geography*.

lage receptacles, another by the development of hypodermal aqueous tissue altered by enlargement of epidermal cells and others by two or more of these features.[2] There are structural adaptations as well as functional adjustments; and the former may be different in the different species of a region. The different species use the environment for the maintenance and uplift of their own consocies as well as of the entire plant formation.[3]

Successive Plant Adaptations.—Nor are the conditions of life fixed. In a given fixed area organisms succeed one another because of changes in conditions. These changes make impossible the continued existence of the forms present at any given time; with the death or migration of such forms, others adapted to the changed conditions occupy the area, whenever such adapted forms are available. Thus one society of plants commonly prepares the way for another. For example, the lichens and mosses, growing on bare rocks, disintegrate the rocks and form soil in which other plants can strike root. Ponds and lakes gradually fill up through the growth of pond societies until they are transformed into swamps, in which the pond lilies, pond weeds, eel grass and other representatives of pond societies are replaced by rushes, sedges, *Sagittariæ*, cat-tails, reeds, true flags and other representatives of swamp societies. Through the growth of the swamp societies, the swamp is finally so crowded that it is transformed into a mesophytic area, and the plants of the swamp societies are succeeded by mesophytes. It is obvi-

[2] Ana Hayden: *The Ecological Anatomy of Some Plants of a Prairie Province.*

[3] *American Journal of Botany*, Vol. VI, 1919.

ous that the hydrophytic societies have been exceedingly important factors in transforming lakes, ponds and old river beds into tillable land, and the fertile soil of such areas is due largely to the humus added through the decay of the hydrophytic societies. On sand dunes, beaches, ground cleared and allowed to grow up again and almost everywhere one can observe plant succession. On sand dunes around the Great Lakes, for example, poplars are succeeded by pines, which in turn are succeeded by oaks and other deciduous trees.

Value of Regional Plant Study to Agriculture.—Studies in plant formations in given regions are of great importance to agriculture. In newly settled countries, estimates of the market value of lands are based on the observation of the native growth, especially the tree-growth. Indeed, the studies of successions and societies of plants give us very useful information as to what plants can be successfully grown in a given area. There are instances, as in some of the wild lands of the West in America, where a study of the societies of wild plants has suggested the kind of crop plants best adapted to the conditions. It is quite probable that more extended studies in ecology in connection with soil analysis will reveal so close an association of plant societies with the chemical and physical characteristics of soils that the chemical and physical differences of soils on different farms or in different parts of the same farm may be accurately judged by observing the societies of weeds and other wild plants. In reforesting a given area, it is very essential to take into consideration the plant societies adapted to the region. For example, it would be unwise to plant pines on bare sand dunes or maples where black oaks,

which grow in much drier situations than maples, prevail.[4] Hilgard regrets that thus far we vainly seek in general agricultural literature for any systematic or consistent studies of these relations. We do find "ecological" lists of trees and other plants, or "plant associations", growing in certain regions or land areas, described in some of the general terms which may refer equally well to lands of profuse productiveness, and to such as will hardly pay for taxes when cultivated. Or, when the productive value is mentioned, the probable cause of such value is barely alluded to, even conjecturally, unless it be in describing "the plant formations" as xerophytic, mesophytic or hydrophytic, upon the arbitrary assumption that moisture is the only governing factor; wholly ignoring such vitally important factors as the physical texture of the soil, its depth, the nature of the substrata and the predominant chemical nature, oftentimes abundantly obvious, of the land. And, on the other hand, we find even public surveys proceeding upon the basis of physical data alone, practically ignoring the botanical and chemical points of view, and inferentially denying, or at least ignoring, their relevancy to the practical problems of the farm.[5]

External Conditions Modify Species.—The botanists played a large part in delimiting the natural regions of the globe. Zoölogists and botanists alike have been impressed by the fact that under different external conditions different species of the same genus are found. While this statement does not hold for all species, yet it holds for many. Natural barriers also are likely to separate differ-

[4] Martin: *Botany with Agricultural Applications*, p. 512.

[5] Hilgard: *Soils: The Physico-Chemical Investigation of Soils*, p. 315; cf. also Clements: *Plant Indicators.*

ent forms (races) of the same species, and isolation of any kind seems to be connected in some way with the occurrence of different forms. Isolation is often assumed to produce its results by preventing the new forms, however they may arrive, from crossing back with the parent species; yet it is by no means true for all species and varieties that they are isolated from each other except in so far as their special conditions of life are different.

"Internal differences may produce physiological isolation which appears as potent a factor as geographical isolation. It might be confusing cause and effect to assume in the former case that the isolation produced the new forms. A not unnatural inference from the facts of distribution is that external conditions slowly modified the forms, and the evidence for this view seems almost irresistible when we find that many animals and plants are distinctly modified when placed in a different environment, without, in most cases, however, transcending the limits of the variety or race." Now, plant life is the true intermediary between the inorganic world and the other. From the former it draws chemical elements which it decomposes in order to assimilate them, by means of its roots from the soil, and its respiratory organs from the open air, so that it constitutes "a living manufactory of food." On this chiefly, and almost on this alone, depends the continuance or the disappearance of the animal population of a country, whether herbivorous or not (Febvre). Osborn observes: "Through the successive adaptation of the limbs and the sole of the foot and the adaptations of the teeth, which are most delicately adjusted—the former to impact with varying soils, and the latter to the requirements of the consump-

tion of various forms of nourishment—we may definitely trace the influences or rather the adaptive responses to the habitat sub-zones, such as the forest, forest-border, meadow, meadow-border, river-border, the lowland, the upland, the meadow-fertile, the meadow-arid, the plains and the desert arid. The mirror of past geography, climate, evolution of plant life in the anatomy of the limbs and feet, is one of the most fascinating fields of philosophic study.''

Regional Adaptation of Animals.—Zoölogists long ago divided the globe into zoö-geographical regions and studied the faunas of different regions. Another and more truly geographical point of view recently has come to the front. The animals of the natural regions of the globe are now studied as forming a part of the features of those regions, and attention is directed rather to the adaptations displayed by the animals than to their zoö-geographical relationships. The white coat of polar animals, the gray or tawny livery of the beasts of the desert, the fine hair of the woolless sheep of the Central Sahara, the thick down on the birds of the arctic lands—these are familiar effects of the regional climate on animal life. Similarly, the animals that leap, those that burrow, those that climb trees with their sharp claws, the fleet-footed creatures of the steppes with slender and powerful limbs—these are so many instances of animal adaptation to forms of vegetation in certain botanical regions.[6] The botanists recognize three great plant formations, which roughly divide the surface of the land among them. These are woodland, grassland and desert. So simple a division would help us little in the case

[6] Cf. Cuenot: *La Genèse des Espèces Animales;* also Borradaile: *The Animal and its Environment.*

of animals; but, since all animals depend ultimately for their foods upon plants, a modification of this classification may serve as a framework for the study of animal distribution. There is, for example, a considerable difference in the life conditions of animals which live in regions where the cold of winter periodically checks plant growth, as compared with those where no such temperature check occurs. This gives us the first distinction between the animals of cold or temperate, and those of tropical regions. In both of these forest, grassland and desert occur, but it is possible to pick out certain well-defined types in order to study the faunas separately. Adaptations to life in the tropical forest occur in almost all groups of animals, and some orders like the Primates among mammals are, roughly speaking, fitted for this habitat alone, for relatively few of their members occur outside this region. Their long arms and short legs, their opposable thumbs and great toes, their strong clavicles, in some instances their prehensile tails, their pectoral mammæ and the reduction in the number of young at a birth—all these fit them for life among the trees. In the tropical forest, food is abundant all the year round, for there is no seasonal check to vegetation such as occurs in temperate climates. The absence of seasons, in the sense in which they occur in higher latitudes, makes possible the existence of many fruit-eating animals, for fruits occur at all seasons. Thus the anthropoid apes are fruit-eaters, the fruit-bats have the same diet, parrots eat seed and fruits, and so on. The constantly high temperature, at least during the day, makes a warm coat unnecessary, so the animals producing valuable furs are relatively rare. The same condition makes reptilian life abundant,

for the heat of the sun is available to hatch the eggs. The high temperature results also in abundance of insects, which again feed many other animals. Moreover, since the tropical forest is characterized by a very luxuriant undergrowth and by great density, we find not a few arboreal forms which never voluntarily put foot to the ground.[7] In deserts, some of the native animals, such as mice and other small rodents, have been known to live on hard seeds without green food for periods of several months, or even as long as two or three years, and nothing in their behavior indicated that they ever took liquid in any form. Deer and peccary are abundant in some deserts in Sonora, where the only available supply of open water is to be found in the cacti. The endurance of the camel is, of course, well-known. It takes water every day when a supply is available, but it is its capacity for accommodation that has made it so potent a factor in transportation over the deserts of Asia, Africa and Australia. Other animals, including the common domestic sheep, are similarly capable of making such changes in their habits that they may go for weeks without a drink.[8] On a rocky shore, swept by the winds and tides, one finds a variety of hardy species which, though not closely related genetically, have many characteristics in common. They are sponges, anemones, hydroid colonies, barnacles, mussels, snails, small crustaceans and a few scavenger crabs. These animals for the most part obtain their food by net-fishing or by straining water through their bodies. They are mostly attached firmly to the rocks,

[7] Newbigin: *Animal Geography*, Introduction and chap. v; Wallace's classical work on *Geographical Distribution* contains copious illustrations.

[8] Daniel Trembly MacDougal: *North American Deserts*.

and thus withstand the violent movements of the food-laden water. Convergence of characters is strikingly shown also in the black colors, soft bodies and luminous spots, characteristic of different groups of deep sea fishes. In the tropical forests the adaptations are not often for resisting, for eating, for resting. "Think of all the animals in the tropical forest—is there one that is radically symmetrical? Here keen senses are at a premium. Life has always depended upon seeing, hearing, feeling better than something else. Lately it has come to depend upon thinking better than something else. And the climax of adaptation in this tropical forest has been the greatest thinker of the ages." Each habitat, representing environment, limits the patterns of the systems of activities that may persist from reactions within it. The type of adaptation is set by the environment. Though adaptation to environment may permit precise adjustment to rhythmical changes extending over considerable periods, and though animals generally become most specialized when conditions are most stable, there is no evidence that living systems are caused to change from one species to another by the transformations of habitats due to physiographic succession. Animals adapt themselves to environment by changing their systems of activities, but such responses are apparently limited in extent to the inherent possibilities of variation within the system.[9]

[9] Professor A. S. Pearse: "The Effects of Environment upon Animals," *The American Naturalist*, March-April, 1922. From evidence in the form of man's relation to climate, Matthew, however, thinks that man is not of tropical origin. This common assumption is due, among other reasons, to the supposed relation between loss of hair on the body and the wearing of clothes, the first being regarded as an earlier specialization in an environment of tropical forests, the second as a secondary adaptation resulting from migration to a cold climate. Matthew observes that the loss of hair in man is

Man's Acquisitions in the Forest.—As an organism becomes more closely adapted to the special conditions of its own environment, and less adapted to the general conditions of the world, it becomes the more deeply rooted to its native region. But man's invention of the tool, using the expression in its broadest sense, enables him to modify largely his non-adaptability to different conditions. This interrupts the increasing adaptation to his native region and overcomes his disinclination to leave it. But the forest, the habitat of the stock from which man diverged, has left its indelible stamp on the human frame. In arboreal conditions the foot became the supporting and branch-gripping member, and the hand was emancipated. Thus man's hand, which remains plastic and generalized, represents a comparatively primitive type of mammalian and indeed of vertebrate hand. The specialized extremities of a horse and a cow are much more highly developed in the evolu-

accompanied by an exceptional and progressive delicacy of skin, quite unsuited to travel in tropical forests. On the other hand, there is no thin-haired or hairless tropical animal whose skin is not more or less thickened for protection against chafing, the attacks of insects, etc. Again, the loss of hair in man is most complete on the back and the abdomen. This is just what would happen if the loss were due to the wearing of skins and clothes. The higher races of man are adapted to a cool temperate climate, and to an environment rather of open grass plains than of dense, moist forests. In such conditions they reached their highest physical, mental and social attainments. In the tropical, and especially in the moist tropical, environment, the physique is poor, the death rate is high, it is difficult to work vigorously or continuously and special and unusual precautions are necessary for protection from diseases and enemies against which no natural immunity exists, and which are absent from the colder and drier environment. This lack of adaptation to tropical climate is also true, although to a less degree, of the lower races of man. Although from prolonged residence in tropical climates they have acquired a partial immunity to the environment so unfavorable to the newcomer, yet it is by no means complete. Matthew concludes that the center of disposal of mankind in prehistoric times was Central Asia, north of the great Himalayan ranges (Vide his *Evolution and Climate*).

tionary sense than man's hands.[10] The arboreal life, with a free hand, led on to an increased freedom of movement of the head from side to side and of the thigh on the hip-bone, to the adjustment of the backbone as a supple yet stable pillar with a characteristic curve in the region of the loins, to an expansion of the chest and a flattening of the back, to an adaptation of musculature for balancing the body on the leg, to a strong development of the collar-bone in correlation with the free movement of the arms and to a specialization of the thumb and big toe for branch-gripping purposes. Man has developed an opposable thumb, but otherwise his hand is a simple tool. "It is the free hand," observes Wood Jones, "permitted to become the sensitive hand, which now, so to speak, goes in advance of the animal and feels its way as it climbs through life." As the forest shrank, the pre-human ancestors had to come to earth. The collateral types in the forests remained in the main arboreal and relatively unprogressive. Professor Lull observes that the erect biped, with a free hand, descending from the trees, would have to become a hunter and an explorer. He would soon need shelter and clothing. For all this he found most serviceable his hand. In the first place, the free hand favored the development of the brain and central nervous system. In the second, this system governed the use of the hand and constituted man a tool-making animal. This system has differentiated in different regions, but its anthropology is not well understood. With the evolution of his tools man stays in his native region, and adaptation proceeds further on a new and higher level.[11]

[10] Jones: *Arboreal Man.*

[11] Thomson: *What Is Man?* p. 21.

Formerly the desert was held to be uninhabitable, but man now to a large extent can master it. One of the most important developments of modern agriculture is that of dry farming, in which forms of economic plants are sought which will produce crops under arid conditions, and constant and assiduous attention is being given to the development of cultural methods which will facilitate the growth of plants in deserts and conserve the soil-moisture by checking evaporation. Yet man's adaptability to the peculiar conditions of his region governs his individuality as an organism as well as his social life. Indeed, though man is the lord of creation, he is neither destroyer nor creator, but exercises his powers mainly as transformer and supplanter. Thus he could not and did not destroy the vegetation he saw round him. Among the plants rooted to their native region he selected some which were edible and useful to him, preserved them and uprooted the others as weeds. Intentionally and unintentionally he thus transforms and supplants not only the vegetable but also the animal life of the region. Animals fell also into man's categories of good and bad, and the latter, mainly the beasts and birds of prey, became marked for persecution everywhere and at all seasons, while the former were tolerated and nursed. Some animals man deliberately protects and the characters of some he deliberately transforms by careful selection and judicious interbreeding. Man's adaptations, then, include a control of vegetable and animal communities. In the preparation of food and the use of raw materials man differs also from the other animals. In defense and offense man does not depend on the strength of tooth and claw. Monkeys use stones or sticks as weapons, but man

developed from a tool-using to a tool-making animal. Thus, descending from the branches, he could live and thrive amidst the difficulties of life on *terra firma*. There he lost the opposability of the great toe to the other toes. His jaw-power was reduced and there was a correlated increase of the cranial cavity. His teeth became more uniform and the canines were reduced. In the collecting stage, the primitive man still needed massive teeth and jaw. When he began to eat grains and his food became less and less coarse, the size of the face and of the jaws and palate was further diminished. With the evolution of tools, man labored less and the bones of the thigh and the leg became less flat. The passage from a primitive to an advanced stage has left an indelible impress on the human body.[12] Thus man has adapted himself to and conquered his environment in a way that no other animal could do. But, in all this, man's activities are limited by the force of environment and biological succession. Thus, how small a number of new cultivated plants man has contributed within the last 2,000 years! Wheat, barley, rye, maize, rice, the potato, the date tree, the banana, etc., all have fed humanity since its early period. Almost all the cultivated plants of ancient times belong to the annual species, for at the beginning of civilization men cultivated the plants which grew most quickly,

[12] Osborn observes: "Both in the muscular and skeletal systems we find organs so far on the down grade that they are mere pensioners of the body, drawing pay (i.e., nutrition) for past honorable services without performing any corresponding work." The primitive man often had to eat far too much bulk in order to secure the requisite sustenance. Man is paying for past history to-day, for his thirty feet of food canal seems to be far too long for modern meals of highly nutritious food, served with approximate punctuality at regular intervals. (See Thomson: *Everyday Biology*, p. 44.)

and perennial cultivated plants were rare.[13] Babylonia and Egypt were the primitive centers for barley, wheat, the date, the grape and flax. The date palm in its wild state yielded here food of some value. These regions were subject to periodic flooding by the rivers, which renewed fertility, and from the choice of plants that the flooded ground offered man picked out those of some use to him and suppressed the rest. Thus these regions were the seats of early cultivation and civilization. In North and South America, again, the conditions of climate and soil were highly favorable to agriculture, for these continents offer a fair list of indigenous cereals, tubers and pulses yielding good crops even to superficial tillage. Maize especially was admirably suited for a race of semi-migratory hunters. It could be sown without ploughing; ripened, in a warm season, even in ninety days; and harvested without a sickle and at the pleasure of the cultivator; and it needed no preparation beyond roasting before it was ready for food. The beans and pumpkins which the Indians raised also needed only a short season. Hence many American Indian tribes, while showing no trace of pastoral development, combined with the chase a semi-nomadic agriculture; and, in a few districts where geographic conditions had applied peculiar pressure, they had accomplished the transition to sedentary agriculture. As regards the supply of animals susceptible of domestication the Americans were, however, more meagerly equipped than the Old World. In North America, at the time of its discovery, only the dog was found tamed. Thus, agriculture was practised there by many tribes that

[13] Brunhes: *Human Geography*, p. 250.

had never passed through a pastoral stage nor kept any domestic animal excepting the dog. In South America the llama and alpaca, confined to the higher levels of the Andes, were used in domestic herds only in the mountain-rimmed valleys of ancient Peru, where, owing to the restricted areas of these intermontane basins, stock-raising early became stationary. Moreover, the high ridges of the Andes supported a species of grass called *ichu,* growing up to the snow line from the equator to the southern extremity of Patagonia. Its geographical distribution coincided with that of llama and alpaca, whose chief pasturage it furnished. Similarly in Australia the lack of a single indigenous mammal fit for domestication, and of all cereals, blocked from the start the pastoral and agricultural development of the natives. On the other hand, the abundant supply of animals, especially those fitted for nomadic life, produced in the widespread grass-lands and deserts of Europe, Asia and Africa the most perfect types of pastoral development in its natural and nomadic form.[14] The great grassy steppes and deserts are the natural habitat of the running animals, the ostrich, the wild sheep, the wild ass, the camel and the horse. The horse finds its natural home on the open plain or meadow where grazing is afforded, and is comparatively poorly equipped against the rigors of the desert. The camel is the principal animal of the drier regions of the xerophilous climates. "There is no accounting for a camel," observe desert dwellers. In bodily form the camel seems to be a relic of prehistoric times, a survival from the Pleistocene, and he has tastes as peculiar

[14] Cf. Gautier: "Nomad and Sedentary Folk of Northern Africa," *Geographical Review,* January, 1921.

as his appearance. In the midst of green grass the camel languishes and grows thin, but surrounded by sagebrush and thorny vegetation he is thoroughly happy. Some camels are cold-weather animals. They graze all summer and store up fat in their humps to carry them through the winter's work. If the usual procedure is reversed by working them in the summer, when the heat draws heavily upon their strength, and letting them graze in the winter, when there is barely enough vegetation on the plains, their humps become thin and flaccid. Similarly sheep and goats, which live chiefly upon grass, but may subsist also upon shrubs and dry bushes, belong to the xerophilous climates as well as to the zone of the steppes. These impose on vegetation a special adaptation to dryness, and on human settlements habits of regular and periodic migration to new pastures for the herds which furnish their food and support.

Pastoral Life and Nomadism.—In their wanderings the nomads in the arctic tundras of Northern Asia do not have any will of their own. They are led by the herds which feed on the lichen that the tundras supply. The reindeer go where they please; the tribes follow. In the Asian deserts, where the lack of pasturage spells disaster to both the animals and the personnel of caravans, men follow the herds of native grazing animals. Looking out upon the enormous herds of wild yaks, wild asses, wild sheep, antelopes and gazelles, all well-nourished and fat, one would think it a simple problem indeed to feed the domestic animals. But the native herds have an instinctive knowledge of grazing-fields. The wild asses, for example, profiting by the experiences of their ancestors for generations back, have followed their mothers and the herds from place to

place since they were foals. They benefit by what others have learned before. This holds true for all native grazing animals. But the domesticated animals lack this ready access to, or knowledge of, the pasture lands. And men who guide them know as little as they. The interests of extensive animal raising are incompatible with an absolutely sedentary life and an intensive exploitation of soil resources. Thus the phenomena of domestication and the phenomena of cultivation are interlinked with their far-reaching effects upon the industries and social life of men.[15]

Both animals and plants bear transportation to long distances. The horse, for example, which lends itself to manifold uses, has now found a home in advanced societies in every part of the world.

Cultivation and Domestication, and Their Reactions on Man.—The discovery of the New World led to a great disturbance in the distribution of cultivated plants. Plants of the Old Continent spread over vast stretches of the New World, while the cultivated plants possessed by the American Indians, such as maize, potatoes, tomatoes, kidney beans, pineapples and strawberries, tobacco, quinine, cascara sagrada and cocaine, cotton and rubber, invaded the Old World. The horse and the sheep are among the domesticated animals which were first "broken in" in Central Asia. Thence they spread with the migration of the Aryan races of the Old World into Western Europe. The bovine race was domesticated by the first sedentary cultivators, the husbandmen of the hoe, who are still met with in Asia, Africa and South America. In the course of migrations domestic animals assume distinctive regional characteris-

[15] Semple: *Influences of Geographic Environment*, p. 63.

tics. Moreover, the same species in different regions meets different human needs.[16] Thus in China the ox serves as a draught animal only, and the cow's milk is not used. Similarly, plants are notoriously susceptible to differences in the environment because of their close relationship to conditions of soil and climate. It is a familar experience to find that varieties of plants of proven worth in one locality fail miserably to live up to their reputation in another. Now, to a certain extent this is true also of animals, but it must be patent to any one that live stock is on the whole relatively independent of environmental conditions. At the present time, the construction of suitable shelter is a universal practice, so that to-day domesticated animals exhibit an independence of environment as great as that of man himself.[17] But skill and forethought in the treatment of domestic animals are recent acquirements, while the stock of animals that belong to a given zoö-geographical region limits man's choice. It is these which form the nucleus of the domestic stock which man chooses to share the land with him, and these possess features of their own that leave an indelible impression on his economic life. Their number and variety, their temperaments and habits, combined represent an invaluable economic asset; while their influence on the arts of cultivation and on industries mold man's own character, structure and habit and guide the lines on which his civilization develops.

[16] Hahn, in his study of domestic animals and their relations to human economy, shows what close bonds unite the animals which he studies with methods of agriculture, with methods of soil utilization and with forms of economic organization.

[17] Babcock and Clansen: *Genetics in Relation to Agriculture.*

CHAPTER II

THE EQUILIBRIUM OF THE REGION

Narrowness of Current Sociology.—The causes and course of evolution of the plant or animal individual and species furnish, as we have seen, promising materials for the interpretation of social and economic life and phenomena. But a far more useful clue for interpretation of social life is furnished by the growth of plant and animal communities in reciprocal adaptation in a given habitat. This is the subject matter of bionomics or of plant and animal ecology, and its bearings on the study of different habits and institutions of different races and regions are significant. The study of growth, forms and structures in human life is connected with their adaptations in different regions. But there is a tendency to ignore social types outside the pale of the Western civilization. A great defect in logical analysis in sociology arises on account of the neglect of wider cultural groups, or types which comprehend the entire life of races and regions other than the purely Euro-American and whose rich social and economic experiments have a no less significance in the evolution of world life. The social sciences have not hitherto sufficiently taken into account the diversity of environment and the variety of life-schemes and values in different social and historic series. In biological studies, botany has developed towards ecological surveys and distributional inquiries.

Zoölogy tends in the same direction, while anthropology, still more than either, seeks to learn from the study of a region the peculiarities of the life of man and his customs, though much error has resulted from an identification of political and administrative areas with the units of Anthropo-Geography. The impact between the East and West in recent years has given rise to the sciences of comparative ethnology and jurisprudence; the types of communalism in Asian polity also have been a revelation to the Western student of political evolution. But the economic structure and evolution of the East have as yet no significance for economists. Social and cultural anthropology has come to discover a variety of social values and life-schemes, but general sociology clings too much to an analysis of Western social history.

Plant and Animal Communities.—Recent investigations in plant and animal ecology emphasize that mutual aid and combination among plants and animals differentiate a region into a relatively circumscribed formation with its peculiar flora and fauna and favorable correlated modifications. In general many species grow side by side and many different growth-forms and types of symbiosis in the extended sense are found collected in a plant community. For even when one species occupies an area as completely as the nature of the soil will permit, other species still can find room and can grow between its members. The demands of the various species differ widely, while sometimes different species are of service to each other. In fact, if the soil is to be completely covered the vegetation necessarily must be heterogeneous. Plant species can avoid competition by developing at different times and by having their subter-

ranean organs at different depths. In the plant community, Woodhead has suggested the term "complementary association" to denote a community of species that live together in harmony, because their rhizomes and roots occupy different depths in the soil. The greatest aggregate of existence arises where the greatest diversity prevails. In plant communities there is, indeed, often or always a certain natural dependence or reciprocal influence of many species upon one another; they give rise to definite organized units of a higher order; but there is no thorough or organized division of labor, such as is met with in human and animal communities, where certain individuals work as organs, in the wider sense of the term, for the benefit of the whole community.[1] Animal geography also, in its dynamic aspects, seeks to explain the facts of animal distribution as we now find them in terms of the relation of the animals to each other and to their environmental complexes. Among animals the battle of the species is not so evident in fact as in theory. In that delicate and complex process of adaptation, which is no less strikingly exemplified in the simplest as well as in the most complex animals, we usually find the organism occupying some new territory, thereby avoiding competition for food or shelter with its nearest relatives. Evolution thus assumes a more peaceful aspect; new and advantageous characters survive by incorporating themselves into the race, improving it and opening to it new opportunities. The war of nature, indeed, has played an important part in the evolution of animal organization, but it is not fratricidal. There are beasts of prey and beasts preyed upon. The former have developed claws, fangs,

[1] Warming: *Ecology of Plants*, p. 95.

speed, cunning and strength; the latter protective organs, means of concealment, habits of combination, kindness, wariness and many other qualities.[2]

Predacity Condemned by Nature.—On all counts, predacity is inferior and stands condemned. Reinheimer has contended that it is not only the kind of food, but also the method of obtaining it, which makes the utmost difference in evolution. Disease and inferiority characterize the predaceous. They are not confined to "in-feeders." Cross-feeders, too, suffer retardation if they descend, as plant assassins, to the level of predacity. Internal adaptations are largely determined by feeding habits. But these habits, in the end, determine not only the anatomy and physiology of the organism, but even its status. The origin of species is through specialization, the success of species through biological righteousness.[3]

Correlation of Life and Environment: Plant and Animal Communities.—The present geographical distribution of a group of animals is the result of a long series of processes, of action of organism upon organism, and of region upon organism. Thus one of the most striking facts of animal geography is the correlation which exists in any large group of animals between the development of its various species and groups of species and the environmental complexes of the country which forms the habitat of the animals in question, specific differentiation following directly upon changes in the environmental complex. This correlation has long been recognized, but whether the relation is

[2] *Animal Life and Human Progress,* edited by Dendy, pp. 36-40.

[3] Reinheimer: "Coöperation among Natural Species," *The Hibbert Journal,* October, 1922; Patten: *The Grand Strategy of Evolution.*

cause and effect, or only apparently so, and how the various lines of specific differentiation come into being, are open questions.[4] Apart from the coöperative system in animal evolution, we may refer to the now familiar biological fact that no animal lives or dies to itself and mention only the following:

The existence of quaint partnerships, as of crocodile and crocodile bird, of tiger and of tiger bird, and of spider and beetle; the closer commensalism illustrated by certain hermit crabs and their companion sea anemones; the frequent occurrence of parasitism; the establishment of complex domestic and social relations; and the manifold adaptations such as mimicry and masking of plants to animals and the converse. It is well known that numerous flowers are robbed and pollinated by various animals and insects and more rarely by birds, resulting in reciprocal adaptation through natural selection. Either their allurements presuppose characteristic tastes or the access to their nectar is possible only to visitors possessed of a certain bodily shape, or of certain faculties. When adaptation of the latter kind is connected with animals of more restricted distribution, the presence or absence of such adaptation is characteristic of the vegetation of a definite district. The reciprocal adaptation and success are seen at their best in the relations between insects and flowering plants. The development and higher evolution of these plants are determined, indeed, by the structural and functional specialization to the needs of insect visitors. "There is a price to be paid for cross-pollination. If the gain from the process should by any means become less than the cost, the plant may perhaps

[4] See *Evolution in Chrysomelid Beetles of Lephriotarsa*, pp. 52-7.

revert to self-pollination. It is easy to imagine cases in which it might occur. Suppose an insect-pollinated species A in a certain district, and suppose a new and attractive flower B to arrive from another district and establish itself. This will drain off some of the visitors of A and perhaps upset the balance of gain and loss, causing the latter to exceed the former. We shall perhaps then find a tending towards autogamy, and the result would probably be gradual reduction of those characters by which its visitors were attracted, so that it may almost entirely lose them. Suppose, however, that the introduction of B merely reduces A's profit, but does not destroy it; then we might imagine A increasing its expenditure, so to speak, upon attractive characters, so as, if possible, to regain its former predominance. This will perhaps only be possible in plants which have stores of reserve material to draw upon,—capitalists, as they have been termed in contrast to annuals, etc., which have no reserves—proletarians."[5]

Trees with adaptations for attracting ants and insects are characteristic of the tropics, while those of the northern forests are generally wind-pollinated. Thus arise those differences in floral beauty that give to the forest an entirely distinctive appearance. It is in the cold and temperate regions containing a relatively small variety of insects that we find beautiful and gorgeous flowers, while the strong fragrance of desert flowers is adapted to attracting insects from long distances. The white and yellow color and fragrance of night flowers in India attract moths, of which the species and varieties are most numerous. Most plants provided with ant-dwellings supply food to their pro-

[5] Willis: *Flowering Plants and Ferns*, 1914, p. 57.

tectors usually in the form of a sugary liquid in extra-floral nectaries and are also provided with an abundant red coat of hairs which appears in some way to be connected with symbiosis.[6] Schimper emphasizes that the various plants composing a formation indubitably stand in the most manifold relations *to one another as well as to the animals, worms, insects and birds* that inhabit the formation. The question regarding the nature and mode of action of these relations promises to yield most important conclusions bearing on the ecological explanation of the formation, but hitherto has been but rarely approached, and then only in individual cases. We may mention the selective action of animals on plants, which Professor Stall has worked out in the case of snails; the selective action of bacteria on animals, which Professor Haycraft has dealt with skilfully in connection with man; the carnivorous plants, the problem of galls and the symbiosis of algæ and radiolarians.[7] We should refer here also to the symbiosis which is illustrated in the combination of alga and fungus to form a lichen, of fungal hyphæ and the roots of plants (*Mycorrhiza*) and of nutrifying bacteria with leguminous plants; in the agglomeration of certain species of plants which are constantly found growing together; and in the social growth in tropical formations. In the evergreen forests of tropical districts individuals with slender stems and erect, weak boughs eagerly strive after the light and at the same time convey to the light a crowd of guests, including lianas whose weak stems cling firmly to the scaffolding of the tree,

[6] Schimper: *Plant Geography*, Part I, chap. vi; Warming: *Ecology of Plants*, p. 63.

[7] Thomson: *The Science of Life;* also Wheeler: *Social Life among the Insects*, and Portier: *Les Symbiotes.*

and epiphytes which germinate in the branches; while in the leaves both mosses and algæ grow, and occasionally also flowering orchids. In the same habitat some structural feature or features common to all or to many of the plants occur, and many of the plants and animals have characters subserving the same end, so that they all work in harmony with the dominant factor and coöperate in maintaining and uplifting the entire biotic community.

Animals as Plant-Distributors.—We may refer here also to the ecological and geographical part played by ants and birds which are active agents in the dispersal of fruits, especially fleshy fruits and seeds with oil bodies. The attractive color of fleshy fruits of hedgerows, which are important as nesting places for birds, is full of significance. Birds carry seeds to great distances in mud adhering to their feet. The migrations of water birds from Siberia and Central Asia to the Lakes of Kashmir bring about the distribution of seeds, on which further light may be thrown by aerial navigation. Animals may work in diverse directions: they may eat and damage vegetation so as to cause the replacement of one community by a totally different one, and they may act as pollen or seed distributors, as well as affecting plants in many other ways, altering the soil, for instance, by manuring, loosening or compacting it.[8] Warming refers to the fact that an important part is also played by certain animals which search for, and utilize certain parts of plants as food, *e.g.*, stags, hares, mice and the like in forests, also large ruminants in savannas and deserts. Mice and squirrels collect nuts; some of these are left and germinate. Sheep, goats and other herbivorous

[8] Tansley: *Practical Plant Ecology*, p. 168.

animals carry the hooked fruits and seeds of their fodder plants in their coats and hoofs and effect their distribution. The regeneration of the grasses and other useful grazing plants of the American cattle-ranges in some of the Western States is promoted by the trampling of the cattle after the seeds are ripe. It has often been stated that the presence of swine in English beech woods was necessary for the regeneration of the beech trees from seed. Although the pigs feed on the mast, they are supposed to favor regeneration by trampling some of it into the soil and thus enabling the seeds to germinate.

Interrelations of Animals and Plants.—The origin and success of the horse species in grass lands and prairies are significant. Sometimes certain species of plants are favored at the expense of others, so that the whole stamp of the plant community is changed.[9] The manner in which plant shape may be changed by animal bites has been explained by Kleib. Plant and animal communities are systems of correlated working parts, the relations of some being independent and of others reciprocal; they are physiologically different in different habitats, which they alter in their turn, in a continuous process.

We may note a few other interrelations: the slaughter of birds of prey and increase of vermin; the increase of cultivated crops which multiply graminivorous beasts and birds, benefiting in turn their enemies, the beasts and birds of prey; the introduction of rabbits and the change from heather to grass, which, again, influences the animals in the area; the introduction of sheep and goats, preventing regrowth of the forest after cutting; the extension of gul-

[9] Warming: *Ecology of Plants*, p. 84.

leries and the change from heather to rough grass, then to rushes and finally to docks, due partly to the fertilizing of the soil by the food refuse and excreta of enormous numbers of birds, partly to the puddling of the surface by their feet and to the surface accumulation of their nests, resulting in the retention of superficial water, and the transformation of the peat bed, with concealed and deep moisture, into a surface marsh; and so on.[10]

New Study of Regional Interrelations.—Plant formations and animal communities arising out of characteristic conditions of the natural region are familiar to botanists and zoölogists, but ecological surveys to show the interrelations between animal and animal and between animal life and vegetation are comparatively recent. Matters of agreement between plant formations and animal communities of a natural region are forming a new branch of inquiry in ecology. Plant and animal communities are usually in agreement the world over; that is, the growth-form of each stratum of the plant community is correlated with the conditions selected by the animals of that stratum. This is the conclusion of plant and animal ecology. There is often a certain physiological or ecological similarity in the species which select similar habitats. When not morphologically similar, animals living in the same or similar habitats are ecologically equivalent; that is, they meet the same conditions in different ways. This is true of the species of plants as well. Secondly, mammals interlock extremely closely with their life environment, namely, with bacteria, protozoa, insecta and many other kinds of invertebrata, with other vertebrata and as well with the constantly evolv-

[10] Ritchie: *Animal Life in Scotland.*

ing food supply of the plant world; consequently the vicissitudes of the physical environment as causes of the vicissitudes of the life environment of mammals afford the most complex examples of interlocking which we know of in the whole animal world. Osborn explains that the mammals interlock in relation to all the surviving forms of the life which evolved on the earth before them. Although it was suggested nearly a century ago by Lyell, the demonstration is comparatively recent that one of the principal causes of the extinction of certain highly adaptive groups of mammals is their non-immunity to the infections spread by bacteria and protozoa. Thirdly, there is an intimate relation between man's economic activity and the nature and succession of vegetation and animal life in the region. These supply man directly or indirectly with his food. These provide also the materials necessary for his clothing, shelter and tools. It is thus that the variety of plants and of animals, and the manifold uses to which these may be put by man's growing intelligence and experience, govern materially the economic method and the social life of the communities concerned. The cumulative effects of climate, food and type of labor evolve the racial type which can best utilize the resources of the region. The food and the standard of living are adapted to climate and environmental resources. There is established a socio-physiological balance between man's normal output and expenditure of energy and the natural store of energy he draws upon. Lastly, in the same region, there is always a certain natural dependence upon one another of different economic types that may coexist. We are here introduced to the idea of social symbiosis. In Central Africa the hunters furnish their neigh-

bors, the settled tribes, with the spoils of the chase and the latter in exchange give food-crops. Hunters and shepherds accommodate agriculturists, but each group keeps to its own profession and they never unite in any other way. Like the harmonic animal and vegetable aggregations which are mutually interdependent, the different economic types in the same region live in harmony with one another and with the whole inorganic and organic world which they confront, establishing one equilibrium, though a shifting one. Now, as before, man, his works and experiences, the traces which his labors leave on the ground, still form a part of the physiognomy of the region. His development and social evolution, his dealings with the earth and with the flora and the fauna establish a mutual adjustment with the region. There is a certain amount of hostility among the various parts within the region, but a process of selection goes on till approximate reciprocal adjustment is attained and the parts live in symbiosis. On the whole, man's success depends upon his rôle in securing a more or less stable equilibrium of the whole living world.

CHAPTER III

RELATION OF HUMAN TO PLANT AND ANIMAL DISTRIBUTION

Man's Achievements in Transplantation.—There is another direction in which plant and animal ecology throws important light on the problems of social adaptation and evolution. The study of the distribution of plants and animals will be incomplete if we neglect cultivated plants and domesticated animals and their transplantation in similar climatic regions. Thus rice and sugar, whose original home is India, have now established themselves in various parts of the world; similarly, the various fruit trees such as the peach, lemon, orange and lime, as well as cotton and white mulberry, have spread from China to similar climatic regions. Of the important plants of American origin, maize, tobacco and the potato now are cultivated throughout the world. The success of cinchona, rubber and tea in the Far East also shows vast addition to wealth and comfort due to the domestication of plants hitherto unused or only produced by unaided nature. Africa had few plants fit for cultivation to offer the Negro when first he peopled that continent. The yam, date palm and certain species of millet were perhaps all. How much poorer America would be with its domestic stock limited to its native llamas, and without the wheat, rye and oats, the pears and apples, the hemp and flax which reached it from Europe after Colum-

bus had pointed the way! Still more is the prosperity of the "New Countries" bound up with man's power of trying afresh the successful experiments of the old countries. The sheep and cattle, the sugar cane and wheat of Australia; the wheat and wool of New Zealand; Canada's grain crops, her flocks and her herds; all of them are foreign to the lands they have made prosperous. One and all, man has brought them to the new soil and tended them to new fruitfulness.[1] Consider the varied and profuse plant life of East Africa enriched by newcomers—plants, trees, flowers and species introduced by the Arabs, the Portuguese, the Indians and the British, brought from many parts of the world—so that the islands have practically been converted into vast botanical gardens. There are cloves from the Moluccas, mangoes from India, nutmegs from the Banda islands, cinnamon from Ceylon, guavas from the West Indies, oranges and bananas from India and China, and plants and fruits from Central America, added to the rich indigenous flora which includes the beautiful oil palm of West Africa, and other magnificent palm orchids characteristic of native tropical vegetation.[2]

Improvement of Plants by Scientific Cultivation.—Man's discovery of the laws of heredity and the arts of breeding and, consequently, of the possible improvement of plants has recently opened up unlimited possibilities. We now understand the effect of environment in fitting plants to survive particular conditions and to depend no longer upon chance, the well-tried method of the ancient nomad. Thus, as a recent writer observes: "The search has become defi-

[1] Ritchie: *Animal Life in Scotland,* p. 242.
[2] Enock: *The Tropics,* p. 209.

nite and organized. Governments and corporations are searching the world in an organized way that each section may secure crops best fitted for it, by getting and improving the plants from similar places throughout the world. The climate of Arizona is dry; but we now know that every desert in the world has been developing plants that will thrive in Arizona; for example, in the Old World, the olive illustrates adaptation to a dry environment. The alfafa from Siberia or the peach from Mongolia, is hardy as a result of natural selection during ten thousand or ten million raging winters followed by the same number of blazing summers. These plants may be well adapted to conditions in some parts of the United States." The manifold increase of sugar in the beet within a century is indicative of further changes that may be wrought in any plant and are now in actual progress in many. Surprising results have been obtained in producing kinds of corn which are (a) more vigorous and productive; (b) more oily; (c) more starchy; (d) more highly charged with proteins than are ordinary varieties. As a result of the search for the plants of the world's cold and arid deserts and the improvements of plants there found, new crops are already being produced and harvested in lands previously considered too arid or too cold for any use save as scanty pastures. One of these quick-growing plants is the Kafir corn, now grown near the 100th meridian in the United States, where, for every mile it pushes the farm line westward, it opens to cultivation 1,600 square miles of farms, which, under existing American conditions, will support easily 75,000 people and in some countries would support several times that

number. The thornless cactus may make good pasturage in what is now the dead desert. The wet lands may receive almost equal benefit from new crops.

Plant-Breeding and Acclimatization in India.—Experiments have been conducted by the Department of Agriculture in the different provinces of India to obtain on their experimental farms improved strains of various crops. Following the usual lines, several promising strains have been isolated and their qualities tested. It was once estimated that there are 5,000 varieties of rice in Bengal alone at a particular time. Many of these are confined to localities and found to be sterile outside their region. The Swati variety of Peshawari paddy has been improved on an experimental farm in Bengal so that it gives a large yield in dry weather. Similarly the Badshahbhog variety, which is obtained from a lowland field where there is water throughout the growing period, gives a large yield and shows what the possibilities are on suitable land. In the case of wheat the great need is for a high-yielding, strong-strawed, bearded variety. Several promising wheats have been produced by the work of the Howards at Pusa, and experiments are being made with them in the different provinces.[3] A series of sugar canes have been tested at the Sugar Research Station and gave large yields, and the suitabilities of these to other areas are being tested on the experimental farms. As regards cotton, it has been found that the plant is so much influenced by its environment that in some provinces, as Gujarat, varieties which appear to be absolutely the same from a botanical point of view have, nevertheless,

[3] See their monograph on *Wheat in India.*

individual characteristics which allow them to be grown in perfection and with profit only in the tracts where they have become the actual children of the soil. Thus, exotic varieties thrive better in red or sandy soils and have thus only been introduced permanently with varying degrees of success outside the regular Superior Indian areas, e.g., Dharwar American, Bourbon in Coimbatore, North Gujarat and the Konkan; Egyptian in Sind; Upland Georgian in the Panjab and the United Provinces. This shows that careful trials and experiments have to be undertaken before any attempt is made to introduce varieties of crops from outside or even to import a variety from one province to another.[4] The lessons of failure, e.g., of eucalyptus imported from Australia to South Africa, must also be remembered. On the other hand, the endemic fever in the most unhealthy parts of Algeria has been completely checked by the plantations of eucalyptus. The havoc that imported weeds create conveys a serious warning. Water hyacinth, for instance, was introduced in Eastern Bengal by one Mr. Morgan, belonging to a jute firm, who took a fancy to its flower. Within a very few years it has spread all over the river districts of Eastern Bengal and presented a grave menace to the country. Its growth has been so phenomenal that navigation by boats through some *khals* and *bhils* has become difficult and in some places crops, especially jute crops, have suffered. On the other hand, scientific plant-breeding, which is based on the ecology of plant growth, has within it the germs of the transformation of the agriculture of the region concerned, as has been il-

[4] Cf. Report of the Indian Cotton Committee.

lustrated in referring to the thornless cactus and the Kafir corn. To conclude: "By this work of the plant explorer and the plant breeder, we can get the new cold-resistant or quick-growing plant that pushes the farm line north or the new drought-resistant plant that pushes the farm line into the arid, or the better-yielding plant for the fields now under cultivation. By the combination of the searching the world's cold and arid deserts and the improvement of plants there found, new crops are already being produced and harvested in lands previously too arid or too cold for any use but scanty pasturages."

Adaptation of Animals to the Requirements of Man.—The laws which govern plant-breeding apply also to animals. We need not multiply instances of successful breeding of animals in regions in which they were not indigenous. The horse, the old home of which is Asia, was introduced to Western Europe and is now largely limited to the peoples of the Caucasian race. Where the horse has been long in regions of scanty food supply, it has degenerated in size. Ponies have been thus produced, the breeds usually bearing the name of the region of origin—Russian, Manchurian, Welsh, Iceland, Orkney, Shetland, Zacatecas—and many of them show pronounced adaptation to their environment. The mule and the donkey, especially the latter, prevail where conditions of life are hard. Throughout the desert region from Morocco to Pekin these animals are bred and used. The ability of the mule to resist more humidity of climate than the horse gives it preference over the horse in the tropics and in the southern part of the United States. As cattle can survive the tormenting tropical insects better

than horses or even mules, the ox is probably the most used agricultural animal of the tropics. The ox, though slower, is stronger and steadier than the horse, and deep in the mud of a swamp will pull where a horse would refuse. Thus, in the well-watered fields of the level plains and deltas of India and South-East Asia and on the very bad roads, the ox is universally used. On the muddy roads and muddy rice fields of Malabar, the Kistna and Ganges deltas, the Philippines and South-Eastern Asia, the water buffalo is of great economic importance. The Indian buffalo was introduced into Western Europe by the Arabs and is now found in South Italy and on the Balkan Peninsula. The camel, which is distributed from the Western Sahara through Central Asia to Eastern Mongolia, lately has been introduced successfully into the Australian desert. The elephant thrives in the tropic regions of Africa and Asia, and has been domesticated only by the Asiatics in modern times. Eating much more in proportion to his weight than any other animal, he can thrive only where the humid tropic climate makes fodder abundant. In India he draws wagons and guns and carries princes. In the forest and timber yards in Burma, he hauls and piles logs with great skill and cleverness. The reindeer, whose home is on the bleak, treeless arctic plains called tundras, has been introduced recently into Alaska and Labrador, countries similar to its own, and the introduced herds are rapidly increasing. The yak, which is adapted to high elevation and scanty food and especially to deep snow, is at present used only in Tibet and the adjacent high regions of Central Asia. Naturalists point out that large areas of Canada, not well suited to ordinary cattle, might well be given over to yak pasturage.

Similarly, the llama of the highlands of Peru and Bolivia might be adapted to some other mountainous regions.[5]

Man's Possibilities of Adaptation.—All these instances from plant and animal breeding and selection show the possibilities in the direction of adaptation of human stocks to regions similar to those in which they are born and bred.[6] The importation of plants and animals evolved in similar climates contributes towards agricultural reconstruction. Similarly the possibilities of economic and cultural renewal which immigration of similar stocks holds out for the decadent and backward races will be more and more realized as a practical program of coördination of the world's surplus labor. But man is not only a feature of the region, he also remolds it. Thus the plants which are grown, and the animals which are bred, as well as the process of utilization of the botanical and zoölogical resources of the region, remake for man the region. Indeed, the social environment, together with the geographical features of the region, is man's heritage. If we admit this, the mode of life which is society's path of least resistance becomes ultimately as important—within, of course, the limits of progressive adaptation—as climate and food, to which a stock needs to be accustomed for successful living and thriving in the region.

[5] For many of these data I have freely used Newbigin's *Modern Geography*, Russell Smith's *Industrial & Commercial Geography* and Brown's *Principles of Economic Geography.*

[6] But man's pride would be humbled if he remembers that "out of the hundred thousand or more species of animals whose domestication is theoretically possible and whose utility would certainly be profitable, he has succeeded in really domesticating some fifty at most, and that only after prolonged efforts." But of what great consequence to his civilization have been even these few!

Association of Man with Food, Plants and Draft Animals.—The full meaning of the association between racial peculiarities and types of cultivated plants and domesticated animals cannot perhaps be formulated forthwith, but it is interesting to note here some connections between human and plant and animal distribution. Some plants or animals are usually associated with the civilization and spread of particular races. Rice cultivation seems to be at the basis of the life and culture of the original inhabitants of India. It is the only crop that succeeds under wet summer conditions in the region of monsoon climate in Asia. Thus this grain is to the regions with moist summers what wheat is to the regions with dry summers. Russell Smith observes that, in the adjustment of plants to different climates, nature fortunately has given the rice plant an ability to survive conditions which are fatal to the successful growth of the grains which have been the great dependence of the white races. The humidity that debars wheat from the cotton belt and makes parts of that region unsatisfactory for corn, is still insufficient for rice, which is really at home only in the swamp, the kind of land from which the white man mostly has run away, although for centuries and milleniums it has been the choicest of the choice fields in the rice-growing lands of India and China. Without rice the human race would be greatly handicapped for want of locally grown cereal food in some parts of the warm temperate zone where there is a heavy summer rain, as along the Gulf Coast in the United States and also in the torrid zone, especially Equatorial South America, Equatorial Africa, the East Indies and great stretches of the southern and eastern coasts of Asia. In such a climate

all the European grains—wheat, barley, rye, oats and buckwheat—fail miserably and corn is far from its best, owing to the bad effects of the moisture. Even if the people could afford to buy, commerce would find difficulty in filling the gap, because it is so difficult to store these northern grains in a hot moist climate.[7] In Asia the monsoon, which is one of the most important factors in the relation of man to the earth, gives rain at the season of greatest heat and greatest growth, rather than in the cooler period of least growth as in the cases of the winter rainfalls of California, South-Western Europe, Australia, etc. The climate of rice land possesses, first, the intermittency which compels people to work during the non-productive season of drought, and then rainfall enough to permit the production of food for great numbers. This explains not merely abundant production, but also the densely-packed populations of South-Eastern Asia and its adjoining islands, which contain more than half the human race. The special skill required in the growing of rice by irrigation, constant care and hand labor is difficult for other groups to acquire, while they have left their stamp on the social life and institutions of the native inhabitants. Where nature has not been so kind as to provide level land suitable for rice-growing, as in the level plains and deltas of the great rivers, man, in some places, has expended almost inconceivable labor in making his farm into a series of ponds, into which and from which water may be turned at will. Russell Smith's remark in this connection is significant: "We sometimes count the pyramid of Cheops as one of the wonders of the world, one of the greatest monuments of human

[7] Russell Smith: *The World's Food Resources*, p. 86.

labor; but its construction was child's play in comparison to the work done on paddy-fields at home at the same and later periods in many an oriental sultanate." In a similar way wheat is the cereal of peoples who have to fight the rigors of the winter climate and is associated with the individualism and enterprise of the pioneer who pushes the farm line into the cold, temperate climes with a dry summer. With the aid of modern machinery and transportation, wheat is a money crop, easily grown on treeless frontiers of agriculture. It keeps well, is easily transported and is in universal demand. Wheat-growing, like civilization, has moved with the pioneering peoples of the West to the sparsely populated open plains such as the Red River valleys of the United States or the virgin prairies of Canada, the treeless plains of Argentina and Australia or the endless steppes of Siberia. Among races in Western Europe, it is pointed out by a recent writer, the eastward extension of the French marks also the eastward extension of the sweet chestnut, and the battle ground between the French and German peoples near the Rhine is the region where the growth of the sweet chestnut as a planted tree reaches its eastward limit. Such facts, must not, of course, be overemphasized. Both must indicate a climatic change, but it can hardly be supposed that this change of climate is sufficient to affect man directly. Thus Newbigin, a cautious writer, concludes: "It seems at least justifiable to point out that every human group which reaches any degree of civilization and stability must depend for its permanence in the early stages on some special skill in the growing of certain cultivated plants, and the rearing of certain domesticated animals." The skill required in preparing rice

fields with smaller area and higher banks, turning at last into a giant flight of gentle water-steps, or in conducting the water channels from terrace to terrace, is difficult to acquire by those who have not lived in the monsoon regions. Peoples in the desert region of Asia and Africa have been nursed by the camel, without which animal the region could not have been inhabited at all. The life of the caravaneer who has to endure the trials of the desert and live upon its harsh vegetation is the life of the camel writ large. It cannot be lived by a European buccaneer, however enterprising. So useful a draft animal as the camel cannot be managed by the European without native help.

Risks of Disturbance of Natural Equilibrium.—Newbigin states with clearness: "Given an evolving group spread over the surface of the globe and taking with it its characteristic plants and animals, it is probable enough that such a change of climate, even a minor change, as may be sufficient to render it impossible to cultivate these plants, or to rear these animals, may give a definite and more or less permanent check to the spread of the race."

This adds a new difficulty to the problem of colonization and settlement. Mendel's laws which govern plant and animal breeding apply, though in a modified form, to the question of acclimatization and settlement of human groups. In the first place, colonization is most successful where there is much similarity of climatic conditions. Thus, the normal movement of peoples is from countries close at hand, or from similar climates. Secondly, the human group must be considered in stable equilibrium not merely with reference to temperature, humidity, sunshine, altitude, etc., but also to their indirect effects, the interwoven chain of

biotic communities to which it is inextricably linked, the plants it cultivates, the animals it breeds and even the insects which are indigenous to the region. A slight break in the complex web of life is enough to upset the equilibrium. The most notorious case is the introduction of hares and rabbits into Australia with disastrous effects, and the equally disastrous effects which followed upon the setting free of foxes and the escape of dogs. The rabbits found conditions so favorable that they multiplied at an enormous rate, resulting in great destruction of grass to the annoyance of the sheep-raiser. The foxes introduced to keep the rabbits in check increased in numbers and became destructive to lambs. The dogs also became wild and developed a taste for domestic flesh. In New Zealand a somewhat similar series of disasters met man's efforts. Introduced rabbits multiplied and became a pest which cleared the ground of cultivated crops. Ferrets, stoats and weasels were released to destroy them and themselves attacked the native fauna and the flocks of sheep. The common house sparrow and starling introduced into Australia and New Zealand to make an end of insect pests have multiplied at an alarming rate and are showing a preference for grain and fruit.

Problem of Disease-Carriers.—Certain breeds of cattle show themselves immune from disease germs which prove fatal to others. In America, the cattle from the Southern States brought Texas fever as they traveled northward. Its carrying agent is a crawling tick that sucks blood from the semi-immune Southern cattle, gets the deadly disease germ and then bites the Northern thoroughbred and gives the disease to him with fatal results. Now the tick has

been conquered by establishing quarantine. Similarly the African tsetse fly kills all the imported draft animals, but four species of zebra are native and immune—possible bases for the production of an efficient new transport animal. Several million square miles of Central Africa are sadly in need of such an animal, of which a small number have already been produced.[8]

Imported Pests and Counter-Pests.—Along with the importation of lemon grafts into California from Australia, a pest of the plant, a scale insect (*Icyeria purchasi*) was introduced also. After a few years it became so serious a menace that an officer of the Agricultural Department of the United States of America was sent to Australia to study this insect's life history. The insect is not at all a serious pest in Australia, where a ladybird beetle keeps it in check. Soon afterwards this beetle was introduced into California, where it devoted itself to its task so diligently that in a year or two it was dying for want of food. Nurseries have now been established where this beetle is bred and then liberated for the benefit of the gardeners.

Another striking illustration of the tremendous spread of an insect in the absence of its accustomed natural enemies is afforded by the gipsy moth artificially introduced into Massachusetts from Europe, which has become a serious pest. Records show that 407 introductions of foreign plants were made in the United States of America during the first three months of 1913, and the importations of field and garden plants from other countries exceed 1,000 a year. With this great annual inflow of plants come their native pests, and these, unknowingly admitted, have

[8] Russell Smith: *The World's Food Resources*, p. 212.

spread, in some cases with a rapidity beyond belief, since the new land may harbor no destroying bird or insect such as kept the pest in check in its old country. In recent years the introduction and use of counter-pests has been carried out with great skill and deliberation. Insects known to attack certain pests have been brought from their native land and reared, particularly in America, in such numbers that they could be distributed wholesale to the affected areas.

Interrelated Insects and Plants.—Consider the interrelations between red clover and the honeybee in New Zealand. For long the imported red clover bloomed, but the flowers were sterile. Then the honeybee was introduced. It thrives on the red clover's stores of honey, while the flower fertilized by the bee now ripens its seeds. Extraordinarily successful results similarly followed upon the introduction to California of another fertilizer, the fig insect, before the advent of which the fig trees were unfruitful for fourteen years.[9] Now the Californian orchard is famous.

Take, again, the case of certain bacteria in relation to the legumes, which are, agriculturally speaking, the most distinctive family of plants ever domesticated. The bacteria are not the same for different species of legumes. For instance, the clover tubercle will not develop on the alfafa nor that of the pea upon the bean. If the particular species, say alfafa, has never before been grown in a locality, its specific bacteria probably will not be present, in which case the tubercles will not form and no nitrogen will be taken from the air; such a plant then becomes a heavy nitrogen-consumer instead of a nitrogen-producer. Inoculation then

[9] Ritchie: *Animal Life in Scotland*, pp. 257-8.

becomes necessary; for, if the tubercles do not form, the legume exhausts the land instead of fertilizing it, and ultimately dies itself of nitrogen starvation. Inoculation is generally effected by scattering over the surface a little soil taken from a field in which the same legume has grown with well-developed tubercles.

An entomologist has found more than 200 species of insects in a field of red clover. All these have some influence on the pea-louse (clover-louse) and on each other; though the influence is often remote in its effects and practically insignificant. The scavenger insects on the ground and Collembolas, etc., in the soil, feeding on organic matter, affect the texture and composition of the soil and consequently the plant. Without considering earthworms, moles, mice, birds and many other animal factors that might be thought of, we shall mention insects only. The bees that pollenize the flowers and the various insects that destroy the roots and stems of flowers all affect indirectly the louse. As illustrating interactions, though it is of no practical consequence, we may say that the yield of clover seed depends slightly upon the structure of the milkweed flower, for flower-flies, whose larvæ destroy plant lice, are sometimes fatally entangled in the flowers of milkweed. We might even go farther, and implicate all the factors that control milkweed; and so on indefinitely.

Object of the Study of the "Order of Nature."—Such speculation is not altogether profitless, if one bears in mind the fact that only the more immediate influences are of any practical importance and that the effect of one factor may be increased, diminished or neutralized by that of another. Under conditions of nature, animals and plants

approximate a condition of stability or fluctuation within comparatively narrow limits, to the benefit of all concerned. Under artificial conditions, however, as when one man grows one kind of plant over a large area, the insects of the plant multiply rapidly. Man is able to remedy such disturbances of the "order of nature" in proportion to his knowledge of the factors concerned, especially of their relative importance. He has unwisely introduced the English sparrows to subdue caterpillars, but has wisely imported and propagated the native enemies of the fluted scale, the gipsy moth and other pests.[10] For lack of knowledge man also destroys his best friends under the supposition that they are the authors of the mischief which they are really exerting themselves to prevent. In addition to the knowledge of the relations of farm pests to what we may call the natural conditions of their life, we must now know how our own artificial farming operations affect them, which of our methods of culture stimulate their increase, and which, if any, may help to keep it down.

Parasite-Borne Disease and the Distribution of Man.—It has been shown recently that many insects are the sole means by which certain fatal diseases are transmitted from man to man or from animal to animal in an unbroken cycle of insect life and growth. In the case of such diseases, the parasite of which passes half its life history in some of the lower animals—whether a mammal, fish, insect or crustacean—it is clear that the geography of the disease must be largely determined by that of the particular animal in question and vice versa. Clemow observes: "There

[10] Folsom: *Entomology with Reference to Its Ecological Aspects*, pp. 381-2.

are in fact three essentials for the prevalence of such diseases—the parasite, the human subject and the extra human host. The geographical distribution of such diseases may differ from that of either of these essential elements taken separately and in the absence of any one of them it must rapidly die out." The carriage of malaria by mosquitoes, of sleeping sickness by tsetse flies and of plague by fleas are some of the more noteworthy examples. Many disease organisms are, however, not limited to one specific host, and an insect which feeds on the blood of several species of animals may convey the same disease organism to all. Of the animals selected some are probably less susceptible or immune to the pathological effects of the injected microörganism and such hosts then act as reservoirs for the disease of a susceptible animal. There can be no doubt that the distribution of man's settlements has been governed to a large extent by the prevalence of insect-borne diseases. Malaria, for instance, has been connected by some with the decline of the classical civilizations of Europe. Italy and Bengal, with their marshes and stagnant streams, afford ideal conditions for the breeding of the Anopheles mosquito which carries the cause of malaria. Yellow fever, the most dreaded disease carried by mosquitoes of the genus Stegomyia, has ravaged America from Brazil to Washington and on the West Coast from Peru to Mexico. In Africa the European succumbs to sleeping sickness transmitted by the tsetse fly, but the Negro is immune. Hookworm disease, which is spread through soil-pollution, is widely prevalent in India. More than 36,000,000 out of the 40,000,000 people in the Madras Presidency alone are infected. Once it was generally believed that the

shortage and poor quality of Indian labor were caused by the inherent dislike of the Indian for work. Nowadays it is becoming increasingly known that the trouble is in large measure due to physical causes, a very large proportion of the population being victims of intestinal parasites. In parts of Bengal and Assam *kala-azar,* due to the presence in the blood of small parasitic worms, is possibly an old fever but has recently broken out in virulent form, ravaging some of the agricultural districts and infecting nearly 1,000,000 people. The prevalence of this insect-carrier disease has been the greatest obstacle in the way of the agricultural progress of the region. In 1922 Franchini succeeded in inoculating two plants with the organisms of *kala-azar.* It is thus clear that at least one human disease can thrive within a plant. Plant-bugs are known sometimes to attack man, originating disease epidemics. Diseases which seem to be new are frequently appearing. Willycombe suggests that an organism introduced to a human system from another host, if successful in establishing itself under the new conditions, might be then transferred from man to man more or less mechanically by some common insect parasite of man. Thus it is possible that some of the new diseases may be traced eventually to totally unsuspected sources, as for example *kala-azar,* which can live within a plant and could be transmitted by a plant-bug to man. Transmission from man to man might then be easily accomplished by such pests as the bedbug. Such facts are not unparalleled in human history and show that man's distribution over the surface of the earth has been greatly influenced by the distribution not merely of blood-sucking insects, etc., but also of plant-bugs and even

less obvious creatures which are reservoirs of human disease existing in the plant kingdom. Considerable importance is now laid on the regional distribution of disease and its effect on the acclimatization and the survival of certain races.[11] Certain insect-borne diseases seem to be associated with certain climatico-botanical regions, and the native race establishes an immunity to them after a long adjustment. While a migrant people falls an easy victim to such diseases, a new disease introduced by it into the virgin field of another race works havoc and will sometimes bring about the extinction of the latter. The intermeshing of the complex web of the whole biotic community is thus seen to be of great significance for race hygiene and biology.

[11] Cf. Wutschke, for the charts of colonial diseases which so often coincide exactly with some great group of biological facts or with some climatico-botanical zone.

CHAPTER IV

REGION, FOOD AND RACE

Associations of Race with Zones of Vegetation.—There is no doubt, a close association between types of vegetation and certain racial peculiarities. Modern geographers in Europe show that there exist three chief zones of vegetation, the Mediterranean scrub-land, the temperate forest zone, and the steppe or pasture-land; and that, since each of these is determined by climate, each, again, has special types of cultivated plants and domesticated animals, involving in each case a social polity. In a similar way three races of men exist, which show a certain rough correspondence to the three zones of vegetation. These are the Mediterranean race, the Teutonic or Nordic race and the Alpine race. A study of the races of Asia also will show some connection between human life and the distribution of vegetation. In the high plateau country stretching eastwards throughout the entire length of the continent, we have the Alpine race, round-headed peoples, who in Asia Minor sent forth the Hittites, torch-bearers of a great but forgotten civilization. In the Euphrates valley, they developed a settled and elaborate social organization maintained by barley and millet crops which were destined later to play so important a part in the social history of European races. North of this mountain belt, in the grass-land or steppe country, we have the Turanians, who traveled widely

throughout two continents, repeatedly invaded Europe and gave some strains to Russia, the Hungarian plain, the Alps and Central Europe, where they introduced plants and animals of Asiatic origin. The plants of the steppe include those species of cereals which are now grown abundantly in the plains forming the staples of the races of the world. Nor are the wild grasses without service. It is these which form the food of the domestic animals either as pasture or as dry feed in winter. The characteristic of both plants and animals in the steppe is their social character. There are comparatively few species but large numbers of individuals of the same species that live together and multiply and encroach on other areas. Man in the steppe has a similar history. Like the flocks he has lived in large numbers in well-defined areas. He has consequently developed great social solidarity and acquired like the gregarious animals an astonishing mobility to migrate to green pastures. And when conditions are severe, he has swept across and devastated immense expanses in the same way as some of the steppe-dwelling rodents have been known to do. The steppe animals which have been pressed into the service of man or closely associated with him are many, including the saiga antelope, three species of horses, if we include the wild ass as a horse, and, where the steppe passes into desert, the Bactrian camel.[1] Among the steppe-dwelling peoples, nomadism and ample food, including flesh diet, proso and the milk infants need and find so hard to obtain farther south, are still continued, while the horse, which they were the first to tame, is still the mainstay of their fighting, marauding life, which has influenced so powerfully

[1] Buxton: *Primitive Labor*, p. 87.

the destinies of the southern civilizations. In the warmer regions in the south we have members of the Aryan race, with its ramifications in Western Europe and South Asia, whose great staple food is wheat and whose institutions are stamped deeply by the lessons they learnt in their early cattle-raising stage, by their authoritative patriarchal families and their wanderlust. The round-headed Mongolian stock in East Asia seems to have originated in the steppes of Asia, but now has been transformed into the most peaceful and settled people on earth. The autochthonous inhabitants of Southern Asia are still to be detected in the tropical forests of New Guinea, Malaysia, the Andaman Islands, South India, South Africa and the Congo region. Indonesia, supposed to be the original home of the human race, now exhibits its most backward specimens due to the abundance of food in the steaming equatorial forest. But the pre-Dravidians or proto-Polynesians have given to Europe the rice plant and to Asia and Africa the compact village organization based on rice cultivation stamped by the lessons they learnt in their early struggle with the forest and water. The practice prevails in the Philippines and in other parts of Indonesia of walking a water buffalo up and down the fields while they are flooded before the seed is sown, a practice that foreshadows the use of the buffalo with the plow.[2] It is probable that wild rice cultivation originated in the wet tropical forest and thence it spread to north and east where it was improved beyond recognition. The tropical meadows which grew up in the open spaces or on the fringes of the forests encouraged multiple cropping. Agriculture had no longer

[2] Buxton: *Primitive Labor.*

to fight the luxuriant growth and found moreover an ally in the abundant rainfall in summer and thus could easily support a rich and elaborate culture based on rice. Two forest animals have in particular been pressed into the service of man here, the water buffalo which draws the plow in swampy rice fields and the wild pig which roots the rice plants up and which is tolerated only because it eats least out of man's share from the soil. On the bedrock of the rice culture of the pre-Dravidians or proto-Polynesians in the wet tropical meadows, new races have built up a prosperous civilization comparable to the civilization that has grown out of the deciduous forests in Europe. But in the wild equatorial forests man is powerless against the rank vegetable growth. Here have survived some of the most primitive races of the world, and nomadism is the result of man's utter helplessness. In the Malay Peninsula the Semang, Sakai and Jakun are all nomadic tribes who live on wild vegetables and track animals. Similarly, in the forests of Borneo the Punans are nomad hunters, who in communities of twenty to fifty persons constantly migrate from forest to forest, living on vegetables, tallow, wild sago and animals. Where the forest constantly encroaches upon the field, agriculture entails immense labor and yet is uncertain. The more advanced tribes adopt a sort of nomadic cultivation and even where they cease to be nomadic it is necessary for them to move their settlement at short intervals in order to continue to find fertile fields where they can sow some of the lesser crops like early rice, maize, sweet potatoes and tapioca. It is thus that the Negritos have been forced by their environment to continue in their primitive modes of life. The Polynesians,

regarded as a mixture between long-headed immigrants from Eastern India and round-headed Mongols from Indo-China and the rest of South-Eastern Asia, from whom the present Malays are derived, have developed a characteristic maritime civilization on the basis of such durable and portable foods as the coconut, banana and breadfruit, and of their magnificent canoes. On the verge of the Arctic sea in the bleak snow-covered tundras live the Lapps, the Zyrians, the Samoyedes, the Tungus, the Koryak and the Chukchee, whose existence is centered around the reindeer, while fishing races in East Asia have developed a social economy, based on the wealth of the waters, superior in many respects to that of inland husbandmen. Some of them are attracted so much to the sea that floating villages exist in the Far East and there are nomads of the sea in the Philippine region.[3]

Regional Foods and Regional Demands.—If we analyze the milk from three representative animals in three natural regions, we shall learn how the milk is differently adapted as human food to the respective demands in these regions. The mare is a denizen of the vast steppe of Europe and Asia, and is exposed during most of the year to extreme cold: her milk is rich, relatively to protein, in the heat-producers, fat and sugar. The cow inhabits warmer places: there is less demand for protection against external cold, and her milk is correspondingly poorer in fat and sugar. The camel is fitted for life on arid plains under a torrid sun: her milk is even less rich than the cow's in non-nitrogenous ingredients. And, as these different foods are well adapted for the young dependent on them, so are they

[3] Semple: *Influences of the Geographic Environment.*

suited to sustain the life of men living under the different conditions mentioned.[4] Further, the animal industry of the nomads of the vast steppes is devoted to those animals only which do not eat man's food. These are sheep, goats, camels and donkeys, which live on the herbage of the semi-arid land. Usually very few cattle are maintained. Thus what little grain there is in the region, coming by hard labor, is eaten by man. He depends upon milk and milk products of animals that do not encroach upon his means of subsistence from the vegetable world as do the animals of more favored climes.

Food Consumption in Relation to Climate.—Now, the particular plants each race has cultivated and the animals it has raised leave their impress on the whole polity. Indeed, much of the distribution of a race can be explained by the presence or absence of characteristic plants and animals on which it has built its social economy. Special types of cultivated plants and domesticated animals determine for a race its food, and directly govern its physical characteristics. The plants and animals are determined, again, by climate. Thus there is established a reciprocal connection between types of vegetation and dietary and racial peculiarities, all being governed by climate. There is a balance between the expenditure of energy in the normal type of labor necessary to secure subsistence and the energy-giving value of the food of the people. Both the normal food and type of labor react upon a people's bodily and mental characteristics, and, in the process of adjustment of race and region, that racial type probably succeeds which shows the largest output of work with the least dissi-

[4] Armitage: *Diet and Race.*

pation of energy from the inorganic and the organic world. These connections may be made definite by a closer analysis of the dietaries of different peoples. In different regions, the energy required in the maintenance of body heat and work varies. The weight and stamina of peoples in different climates also are different. Much of this depends upon the nature and kind of food, whether, for instance, starch or protein preponderates; or, again, whether durable or perishable, these differences depending upon the characteristic flora and fauna of the respective regions. In the struggle for survival, the dietary is possibly adapted to the requirement of the highest output of work on the basis of recoupment with the least waste of botanical and zoölogical resources of the region. Thus the level of nitrogenous equilibrium of a people is adapted to the supply of exhaustible resources and physiological requirements of work and recoupment in the climate. All this brings about an adjustment of the digestive process, a metabolic balance of the region on the basis of equilibrium between normal output of energy and restoration in a given environment. The scale of consumption is thus adapted to a particular region. In India, clinical researches tend to show that the level of protein consumption which is sufficient for healthy subsistence and normal efficiency of an adult stands much lower than the same level for the European adult, being fifty to seventy percent of the latter's requirements.

Comparison of Food Consumption

	Grams of protein per man per day	Calories
1. Standard requirements for men at moderate work in the Western countries (Atwater)	125	3,500
2. For hard work	150	4,500
3. British war ration	175	4,855
4. Fourteen families in York (wages under 26*s.*) (Rowntree	89	2,685
5. Twelve laborers' families in New York (Wilson)	101	2,905
6. For light work in Japan (Oshima)	100	3,000
7. For hard work (Jinriksha-man) (Oshima)	158	5,050
8. Twenty middle class families in Shantung (Adolph)	111	3,355
9. Artisan family in Bengal	40	2,283
10. Bengali prison diet (McCay)	93	3,500
11. Standard military ration in Baroda (Mrs. Strong)	86	2,400
12. Standard army ration in Baroda for followers	86	2,077

Chittenden's figures of the nitrogen metabolized per kilogram of body weight may be compared with Voit's, McCay's and Oshima's figures as follows:

Bengalis and Ooriyas (rice diet largely)	.116-.120
Chittenden	.120.-130
Beharis and Eastern Bengalis	.140-.160
Japanese poorer classes	.177
Nepalese	.180-.250
Sikkim Bhutias	.250
Average European	.270
Tibetan and Bhotan Bhutias	.350
Nepalese Bhutias	.420 [5]

Sufficiency of Meatless Diets.—Dr. Lusk has recently shown the importance of milk and vegetables. "If one takes milk with other foods, meat may be dispensed with. Thus Hindhede advocates as ideal a diet consisting of bread, potatoes, and a pint of milk. The potatoes yield an alkaline ash, which has a highly solvent power over uric acid, and therefore a good supply of these valuable tubers is needed by a people. Splendid health both of body and mind, the peasant's comparative immunity to indigestion, kidney and liver disease are held out by the bread-potato-fruit." The work of Chittenden has shown that when the protein intake is reduced by one half or less of that which the average American appetite suggests, professional men, soldiers and athletes may be maintained in the best physical condition. One of Yale's champion intercollegiate athletes won all the events of the year in which he was entered while living on a reduced protein or Chittenden diet. Upon such a diet, or less than that, the people of Germany are living today. The principle involves eating meat very sparingly, taking half a piece where one would have for-

[5] Castellani and Chalmers: *Manual of Tropical Medicine*, p. 100.

merly been taken, and using it only for its flavor. The wing of a chicken has little meat on it and yet if eaten together with vegetables it gives the meal a different quality than it would have had without it, and to this extent its use is warranted. The muscles are active when hard labor is done, but the muscles do not need meat for the performance of their work.[6]

Further, meat makes man hot. The adult body does not store protein, but metabolizes with production of heat all protein presented to it. In a warm region, man must give off the heat of labor and extra heat of metabolizing any meat he may have recently taken. It is for this reason that while the primitive peoples of the north live chiefly on hunting for their food, the wild jungle tribes in the tropics prefer a larger amount of leaves, vegetable foods, nuts and fruits. Wild vegetables, including yams, roots and the numerous fruits of the forest are here common foods satisfying the different demands of the body which the tropics make. It is only when these supplies are deficient that they make up their diet by fishing, hunting and trapping.

Vegetarian Diet in India and Japan.—I have pointed out elsewhere that in the Indian system of dietetics, with low protein diet, there is chance of fermentation in the bowels, and it is found that, whenever the nitrogenous element is increased, there is greater increase of fecal nitrogen. Rice is well digested in the intestines, nearly all the starch being absorbed, while the protein absorbed varies from 45.76 to 34 percent. In the case of peas, largely consumed by all rice-eating peoples, McCay finds that 25.42 percent of the

[6] Lusk: *Food in Wartime;* also Hill: "Food Values in Relation to Occupation," *The Industrial Clinic,* 1920.

nitrogen of the food appears in the feces of Bengalis, while only fifteen percent appears in those of Europeans on a vegetable diet. The purely protein diet of Europeans is utterly disagreeable to the Indian constitution, and, apart from a metabolic viewpoint, the clinical hearings also should be taken into consideration, e.g., the rarity or absence of gout and rheumatism. Rho emphasizes that, in making a dietary, the racial food peculiarities, which are, after all, adaptations to the climate, should always be taken into consideration, e.g., the beef-eating Britisher requires a different dietary from that of the rice-eating populations of South-East Asia. In Japan the food of the small farmer class is almost entirely vegetarian, about sixty percent of the total cost being for rice and barley. But there exists an exceptionally ingenious variety of nitrogenous food derived from the vegetable kingdom and the Japanese have become accustomed to digest vegetable protein. The soy bean is a remarkably good substitute for meat. It is very low in price but its nutritive value is very high. The essential element of *miso, tofu* and *shyu* is soy bean. In India as well as in Japan wheat is also very largely consumed. In Northern India wheat, though adulterated to some extent with barley, is consumed in larger degree than rice. If the Japanese were as great users of wheat as the Indians are, they would not have to pay so much for the food when, on the failure of the rice crop, the price of rice is high. Furthermore, rice is more costly in cultivation than wheat in Japan, and its production cannot be so much increased as to keep pace with the population. Many Japanese now look forward to a great production of wheat from the North-East Asiatic mainland

under Japanese auspices, and make out a case for the general population's not relying on rice as a grain food.[7] Of the subordinate foods the most important source of protein is fish. People of narrow means see little of eggs and not much fish, unless it be *kutsubushi*. A report of the Department of Agriculture and Commerce says of the factory workers: "The bulk of workers are females and are chiefly fed with boiled rice in 43 percent of the factories. In other factories the staple food is poor, the rice being mixed with cheaper barley, millet or sweet potato in the proportion of from 20 to 50 percent. In most cases subsidiary dishes consist of vegetables, meat or beans being supplied on an average only eight times a month."

Among the skilled factory laborers in Osaka the percentage of total food expenditure is as follows:

Rice and other cereals	58.74
Fish and other sea foods	7.48
Meat	3.53
Vegetables and groceries	6.74

Comparative Study of Diet.—The true theory of food values can be formulated only after a comparative investigation into the dietary of different peoples. The difference in climate must affect the quantity of food needed, and there are reasons for believing that the amount of energy expenditure per diem in work is less in warm than in cold regions. Much depends also upon the general standard of physical measurement. The food requirement of an average American is based for instance on the average body weight of seventy kilogrammes (154 pounds). In India we

[7] Robertson Scott: *The Foundations of Japan*, pp. 348-51.

have to base our calculations upon an average weight of fifty to sixty kilogrammes among different stocks. Professor Morimoto estimates that a Japanese may be fairly expected to consume only eighty percent of what a foreigner needs, for the average weight of Japanese is only 13 *kwan,* 830 *momme,* to the European's 17 *kwan,* 20 *momme.*[8] Mr. Armitage, by a careful study of the diets of different races, shows that where flesh is not consumed, the physique declines. His conclusions are summarized as follows: Those who live on flesh or fish, where such is readily obtainable, will be men of bulky frame and powerful muscle, capable of displaying great energy, and always very enduring; where such is scarce, the men, eking out their subsistence with chance fruits of the earth, will possess small frames to suit the environment, but again will display great energy and stamina. The perishable nature of their food will render them improvident and gregarious. Those whose fare is wheat or some similarly constituted cereal will have powerful, well-sized frames and their energy will be greater, even if their endurance be less, than that of the foregoing: they will be the pioneers of the world, their food enduring long carriage by sea and land. Now, what are the geographical facts underlying wheat cultivation? Wheat is a cereal of the temperate and not of the tropical regions. It thrives best in dry climates characterized by spring rains. It requires a large amount of human labor and thus it calls for a regular emigration or the use of the most perfected and rapid machines. As it is a plant that

[8] This was a great advantage of the Japanese in the Russo-Japanese War. While the Japanese soldiers required very little food, the Russians required a great deal.

exhausts a soil, it is suited to newly-settled lands. All these human conditions are satisfied by stocks who live on wheat: they are adventurous, hardy, well-built stocks whose staple food is wheat, and it is they who can succeed best in the wheat regions of the world. On the other hand, rice-eaters will be small men, of poor physique and feeble stamina: they will be thrifty and numerous. Rice is very quickly and easily digested, conditions that are important in warm and damp countries where the other cereals cause indigestion. The cultivation of rice demands many hands and continuous work. Hence it can thrive only in the densely-populated regions. Rice grows on easily worked lands, rich and in general low, for these must be not only watered but submerged during transplantation, a long, hard and very unhealthful task. The general geographic fact is that rice is mainly consumed locally in the producing countries with a dense population and a low scale of wages.[9] But rice-eaters also consume pulses. An Indian proverb says: "Rice is good but lentils are my life." In pulse we have everything necessary for the making of a man stout in physique, energetic and enduring. One hundred grains of pulse will supply energy to the body equivalent to 256 calories; rice, 228; and lean meat, 381 calories. It must be remembered that in a hot climate it is necessary that any undue heating of the body be avoided, for the capacity of losing this heat is reduced. One method of diminishing the heat production is to decrease the intake of food, and so there will be a tendency in hot countries to great economy of food. The protein supply reaches its lowest limit, and not only are the alimentary tracts larger but the

[9] Brunhes: *Human Geography;* and Woeikof: *La Geographie,* XX, 1909.

level of the nitrogenous equilibrium is also lower among them. Thus, in a large part of the Eastern world, it is considered anything but a reproach to be sparing in diet, but rather a credit to live on hard fare. People have lived and done well on scanty starchy and sugary food. Such economy with such food acting over immense spaces of time induces corresponding physiological adaptation. Nor should we fail to recognize the importance of the natural organic salts and vitamines which form an essential part of the diet of the higher races in the East. The war has revealed to us the great importance of what are called accessory food factors which before the war had been known as vitamines.

Importance of Vitamines.—The first of the vitamines to be discovered was associated with husks of rice. Rice stripped of its husk will not feed the Asiatic, and unless his rice diet be supplemented with some other food he starves and becomes a victim of the disease, beriberi. Autoclaving the rice and thus destroying the vitamine B is responsible for the development of polyneuritis in pigeons and beriberi in man. Though the parboiled rice can prevent polyneuritis, it cannot prevent ophthalmia. In those districts where the rice is parboiled, ophthalmia is more common than beriberi, while the converse is found where the rice is not parboiled before milling.[10] Rice is deficient in five respects: (1) Poor quality and quantity of its proteins; (2) poor quality of its mineral salts; (3) the absence of vitamine A; (4) the absence of vitamine B;

[10] McCarrison: "Pathogenesis of Deficiency Disease," *Indian Journal of Medical Research*, 1923; *The Practitioner*, January, 1925.

(5) the lack of vitamine C. The diet that produces beriberi in the few can hardly fail to have a deep-seated and bad physiological effect on the many, and ocular evidence of probable malnutrition in the form of the affection of the eyes and skin is rarely far to seek. The necessary vitamine exists, however, in peas and beans which are widely grown by all Eastern peoples who raise rice. If the Indian *dal* be soaked for a day and sprouted for a day, yet not allowed to ferment, it develops abundant anti-scurvy vitamines. The shiny white rice and the split pea which people of the West insist upon eating have lost a most necessary vitamine. Thus a great deal depends upon the process of food preparation. There is yet another essential vitamine which is the one found in milk and butter so largely consumed by Easterners. If we have the right balance of vitamines and salt, we may need less protein and fewer calories. On the other hand, some of the primitive peoples, for instance, the dwellers of the tundra, who live on a diet that is entirely animal, establish the balance by mixing some vegetables. Many other factors also are to be taken into consideration, e.g., the amount of body weight and climate, besides the methods of food preservation and cooking. The very limited dietary of the Chinese and the Indians suggests that the standards developed from observations made in European countries cannot be directly applied to these other conditions so that as regards the body-building foods, and the natural "salts" and vitamines, we may be prepared to find that a far smaller amount, at least of protein and of the calories, will suffice. Researches recently conducted in the Dutch Indies by Jansen and

Donath go to show that the proteins of soy beans, bananas and milk are very powerful in compensating rice deficiency; in this respect even more so than meat.

Eastern Habits and Western Wage-Levels.—This has important bearing not only on the nature and standard of our consumption, but also on the conditions of employment of labor generally. Statistics have proved that the Chinese in America can thrive on a half or a third of the wages the native labor receives. Wage-levels are a gift of race and region, a fact apt to be forgotten by the International Labor Organization, which has not yet based its policy on a comparative investigation into the modes of economic organization and habits of industrial life of the countries of the East. In America the physical and moral dangers of an influx of Eastern population at a lower cultural level than its own are brought to the fore. Yet these Eastern customs and standards are as much products of the geographical and economic environment as are those of the West. And sometimes these supposed primitive standards will reveal themselves as superior to European working conditions.

Comparative Labor Efficiency: Where Easterners Excel and Where They Fail.—Our metabolic changes and the processes of waste and repair connected with our national diet and physical environment necessitate not intense and intermittent spurts of energy, but slow, steady, leisurely work. This is partly also the character of Mongolian consumption and metabolism. Accordingly, those lines of manufacturing industry or types of organization of labor which require long hours of steady, equable work and admit also of leisurely disengagement at intervals are

peculiarly suited to the Indian laborer, who has been known to beat his European compeer in such forms of labor in the actual history of British colonial development. Similarly, Japanese labor is on the way to ousting native labor in food-growing and vegetable-gardening in California, the people of which accordingly now intend to forbid the acquisition of real estate by the Japanese. On the other hand, in the cotton-mills in Japan, far more hands are employed upon a given quantity of machinery than in England; and yet, with the relatively greater quantity of labor, the output per spindle is less in Japan than in Lancashire, the same counts being taken and the output of day shifts alone being reckoned. Similarly, it has been estimated that three times as many Indians as Lancashire operatives are required to produce approximately the same result from a given quantity of machinery.[11] Comparison of efficiencies shows a large gap between the real costs of production in English factories and in those in Japan and India, which cannot be closed by education and better order and organization. Indeed, night work and long hours in the East compensate for the inherent differential disadvantages, though they are of doubtful advantage if they are inseparable from indifferent production. It seems to be a scientific presumption that man cannot toil incessantly, but that he is intended by nature to work hard after certain periods of rest, and that his productivity will be greatly enhanced if there are such periods of leisure at intervals. In the East, non-meat diet and centuries of adaptation have emphasized man's capacity for prolonged toil, relieved as it is in agricultural work and hand production by the exigencies of rest. Thus the

[11] Chapman: *The Cotton Industry.*

unbroken hours of work incidental to the conditions of modern industrialism not only do not tally with the dictates of nature, but run counter to the original capacity of the Eastern peoples. It is, further, a remarkable instance of want of adaptation that no attempt has been made to suit the conditions and hours of labor in the factories to the striking contrasts between winters of great severity and summers of unbearable heat in tropical and sub-tropical regions of the East. Under such climatic extremes, continuous exertion is demanded of people reared upon a preponderance of starch and a minimum of protein consumption. There can be no doubt that great improvements are possible in the following directions:

Adapting Industrial Conditions to the Region.—First, in the warm regions a great deal can be expected from equipping the factories with coolers—while moderate changes from week to week will also be found beneficial. Herein Mesopotamia and Northern India serve as good examples. Second, where the climate is damp, as in Bengal and Madras, the factory operative will be benefited by having the factory relatively dry. The mean temperature and humidity should be varied from day to day to give the most favorable conditions of work. Where these cannot be artificially produced on a large scale, it will be a decided gain if the hours of labor are adjusted to the well-established seasonal changes of the region. Third, much good may be done by introducing meat diet for laborers, for instance, in iron, steel and mineral industries in the mountains, where both the climate and strenuous and continuous work demand a change from the customary diet of the

tropics. A mixed diet of rice, wheat and pulses also may be popularized as conducive to more intense exertion in factory labor under suitable conditions. Last, in countries like China and India, which present the widest variety of climatic conditions, an effort ought to be made to realize the advantages of movement to and from other climates during part of each year, and, indeed, much of the seasonal migration from the highlands to the plains for harvesting work seems to be also associated with the benefits accruing from frequent changes. Huntington thinks that in the tropics the chances for improvement are at a maximum. If means are devised whereby the effects of great heat might be avoided there will be a great increase of efficiency in the tropical and sub-tropical regions, now the most backward, which ultimately will turn the balance of trade and energy in their favor as against the temperate zone, where the mere maintenance of body heat is a source of expenditure of energy.[12]

The Indian Laborer.—In the recent history of factory industries in India we have too often witnessed the deterioration and degradation of labor owing to the violation or neglect of these primary socio-physiological conditions. In fact, the universal complaint of mill managers regarding Indian labor is traceable to the instinctive efforts of the laborers to correct the maladjustment in the fields of biological and sociological adaptation alike. Around the mills there have developed some of the world's worst slums, the seed-plots of vice and disease, where the dangers to health

[12] Cf. Collis and Greenwood: *The Health of the Industrial Worker;* and Starling: *The Feeding of Nations.*

from excessive agglomeration of population have been accentuated by climatic conditions of heat and moisture, though our climate itself provides natural remedial agents, like sun and rain, if only the plan of open air and outdoor life could be imported into our close-built *bustis* and *chawls*.

CHAPTER V

HUMAN ECOLOGY

Man Shaped by His Environment.—We thus see that since ecology is a subject or branch of physiology and includes all the sociological side of animal life, its relations to human geography are particularly intimate. Unfortunately, human geography has as yet derived no benefit from the material and method which plant and animal ecology offers. And yet it cannot be denied that the habits and arts of man are determined in a way similar to bionomical convergence in groups of plants and animals under particular conditions of life. The environmental complex does impress a distinctive type of social and economic structure upon all the stocks of a natural region, even as it governs the *facies* of its plants and animals. Thus the first task of sociology is to classify social types on the basis of natural type-regions into which geography has mapped human history, tracing the ecologic agreement in the plant, animal and human communities of each distinctive region.

Classification of Regions.—The following natural regions have been worked out by Professor Herbertson:

1. Cold lands
   Types:
   - 1a Norway
   - 1b Kamchatka
   - 1c Tundra
   - 1d Yukon
   - 1e Greenland

2. Cool lands
   Types:
   - 2a Western Europe
   - 2b St. Lawrence
   - 2c Siberia
   - 2d Altai
   - 2e Tibet

3. Warm lands	4. Hot lands
Types:	Types:
3a Mediterranean	4a Sahara
3b China	4b India
3c Turan	4c Sudan
3d Iran	4d East African Plateau
3e Mongolia	4e Quito
	5a Amazon
	5b Malay

With certain exceptions, the letters in the above notation represent broad physical divisions; thus, 1a, 2a, 3a are "Western marginal" lands; 1b, 2b, 3b are "Eastern marginal"; c represents mainly lowland, d, highlands or lower plateaux, e, high mountains or plateaux. The countries belonging to each of these type-regions, or groups, possess certain features in common: Features of climate, relief, vegetation, water-supply and the rest.

Classification of Climatic Zones and Their Vegetation.—We give below a classification of the chief climatic zones of the earth based upon facts of vegetation. The plant which forms a part of the natural vegetation of the region, being obliged to undergo the complex and combined effects of all the factors of climate, constitutes a recording apparatus which can show to a remarkable extent, if it be well chosen, the cumulative effects of the different climatic phenomena. Thus, such a classification of climates is all the more valuable as we proceed to consider in what natural regions can live and develop (1) plants which are cultivated and (2) animals living upon plants.[1]

[1] After Koppen and Flahault, quoted in Brunhes: *Human Geography*, p. 235. As water is the dominating factor in any inquiry into vegetation—

Climates of the Earth

1. Warm and Humid
   (a) Climate of the lianas
   (b) Climate of the tropical savannas
2. Dry
   (a) Climate of the date palm
   (b) Climate of the saxaul
   (c) Climate of the herbaceous steppes
3. Middle Zones
   (a) Climate of the olive tree
   (b) Climate of the maize
   (c) Climate of the camellia
   (d) Climate of the high savannas
4. Moderate Cold
   (a) Climate of the deciduous oak
   (b) Climate of the birch
5. Cold
   (a) Climate of the white fox (arctic tundras)
   (b) Climate of the penguin (antarctic tundras)
   (c) Climate of the yak
   (d) Climate of the chamois (Alps)

Correspondence of Species in Similar Environments.—The scientific classification of animal environment is based upon vegetation, physiography or both. Where vegetation

water suspended as vapor in the air, water circulating in the soil and bathing the roots—Penck introduced a classification of climates founded on temperature and based on the effects of water in and on the soil: snowy climates, moist climates, arid climates.

exists, animal communities are referred to the plant communities which form their environment. The botanists have abundant evidence for the correspondence of the formations of similar climates. The vegetation of different parts of the world which have similar climates is similar and the plants, though usually belonging to different taxonomic groups, are similar in growth, form and appearance. Correspondence and similarity of vegetation is not limited to the climatic or extensive formations, but applies also to strictly local situations, wherever the physical conditions are similar. On the animal side we have less trustworthy evidence of similarity or correspondence. If the physiological similarity occurs in the same community, due to selection of habitat and modification of behavior, we conclude that it occurs in all communities occupying similar conditions and that similar situations in different parts of the world have physiologically similar communities, and identical situations, approximately identical communities.

Evidence for Correspondence of Species.—The direct evidences for the correspondence of formations in different parts of the world are as follows: (a) The existence of identical or closely corresponding species has long been known to naturalists; (b) similarity of physiological life histories of many species is well known, as, for example, corresponding species in the United States and Europe or Japan, and a general concentration of breeding in the rainy season in all arid climates, etc.; (c) certain animals in similar environments in different parts of the world appear from the accounts of naturalists to behave alike with refer-

ence to the physical condition of different parts of the day and year and different weather. For example, it appears that there is a close physiological and ecological similarity between certain antelopes of the savannas of Africa and certain savanna kangaroos of Australia. In other words, certain kangaroos are ecologically and physiologically similar to some antelopes. Correspondence is not limited to the gross characters of extensive formations, but is equally true of the more local communities. In matters of correspondence of species there are often striking correspondences within the groups of formations indicated above. For example, there is a striking correspondence in behavior between the meerkats of the steppes of East Africa and the prairie dogs of the steppes of America. The environment is grass-land in each case, but the climates differ. Considering a local formation, as that of the sandy beaches of the sea and very large lakes, we note that along the New England coast and around the shores of Lake Michigan the moist, sandy beaches are inhabited by the larvæ of the beach tiger-beetle. Along the Gulf Coast, at Galveston, Texas, we find the larvæ of *C. saulcyi* inhabiting almost identical situations, holes of about the same depth, etc., while Dr. Horn describes a different larva in like situations and with like habits on the coast of India.[2] An outline of the content of animal ecology prepared by a committee of the Ecological Society of America, in 1920, contains the following useful synopsis:

[2] Shelford: *Animal Communities in Temperate America.*

Distribution of Communities

(1) Land Communities
  (A) Forests with broad thin leaves
    1. Continuously moist and evergreen
      (a) Uniformly warm, affording habitats in six or more strata (Tropical rain forests)
      (b) With cool season (Temperate rain forests)
    2. Intermittently dry or cold, and deciduous
      (a) Warm with distinct dry season (Tropical deciduous forests)
      (b) With cold winter, little winter shelter (Temperate deciduous forests)
  (B) Communities of Evergreen Forests with narrow, thick leaves
    1. Moist Conifer Forest with little undergrowth
    2. Rainy Conifer Forest with shrub undergrowth
    3. Open, arid Conifer Forest
  (C) Communities of Savanna and Grassland
    1. Tropical Savanna (dry season), affording habitats in groves, thickets, forest-margins and grasslands
    2. Tropical Steppe; large herds of mammals
    3. Temperate Savanna; habitats in grove thickets, forest margins and grasslands
    4. Temperate Steppe with cold or dry winters and usually large herds of mammals
    5. Arid, broken, bush-covered Steppe with small herds of mammals

(D) Communities of Winter Rain (forests with broad thick leaves; *e.g.*, California Semi-Desert)

(E) Communities of Desert and Semi-Desert

1. Grass, cactus, tree Semi-Desert with grazing mammals (*e.g.*, South Texas Semi-Desert); succulent Semi-Desert; shrub-covered Semi-Desert
2. Extreme Desert without large diurnal mammals

(F) Arctic and Alpine Lands

1. Tundra
2. Alpine Meadows
3. Ice Fields

(2) Communities of the Sea (Marine):

1. Communities of the Open Sea (Pelagic)
   (a) Mid-oceanic communities
   (b) Oceanic Island communities
   (c) Sargassum communities
2. Communities of the Sea Bottom (Benthic)
3. Littoral communities:
   (a) Communities of eroding shores, sub-divisions based on exposure, bottom material and latitude
   (b) Communities of depositing shores; subdivisions as above plus vegetation
   (c) Special communities: coral, tidepool kelp

(3) Communities of the Sea-Shores. Animals feeding in the sea and breeding on the land or *vice versa*. Classification based on climate

(4) Communities of the Fresh Waters:
   (a) Communities of still waters. Sub-divisions based on size, depth and vegetation; littoral, pelagic, benthic
   (b) Communities of turbulent waters. Sub-divisions based on character of water movement
   (c) Swamps, marshes, etc.

Some Ecological Conclusions.—Successive changes in vegetation are accompanied by corresponding changes in the character of the fauna.

During the successive vegetational stages the numbers of a species increase until optimum conditions of habitat are attained, and thereafter decrease.

The causes of animal succession and the control of animal communities are discussed by Shelford, who draws these conclusions among others.

The development of forest on sand or other mineral soil is accompanied by an almost complete change of animal species and probably by a complete change of animal *mores*.

Forest development is accompanied by marked changes in soil and physical factors. Animal distribution is more closely correlated with differences in physical factors than with species of plants.

Succession of all the animals of the forest communities under consideration is comparable in principle to that in ponds. Succession is due to an increment of changes in conditions produced by the plants and animals living at a given point. Animals, through their effect upon the soil, play an important though minor part in the process.

The various animal species are arranged in these communities in an orderly fashion and the dominating animal *mores* are correlated with the dominating conditions.

Taxonomic (structural) species have usually the same *mores*, though the same species often has different *mores* under different conditions, and different species may have the same *mores*. Species and *mores* are therefore not synonymous.

Scope of Human Ecology.—Animal ecology considers together *mores* that are alike or similar in their larger characters. To this the ecology of human communities seeks to add the physical types of man, density of population, land distribution, occupations, forms of government, etc. We thus see that the great climatico-botanical regions which it is easy to mark off and characterize have their special plant or animal, as well as their special human, character. The direct physiological modifications due to climate are open to the charge of imperfect proof, though determined efforts are made to correlate in detail the physical and psychical characters of the great races with the climate and relief of the areas where they have originated.[3] "It is undeniable," observed Edmond Perrier, "that drought, humidity, a stronger or weaker wind action, heat, light, and even electricity can modify either temporarily or permanently the individual characters of living beings, be they animals or plants. The nature of the food consumed and its super-abundance or scarcity have a still greater influence. If we cannot afford to claim as much for the use or disuse of every organ, at least, it cannot be denied that

[3] Myers: "The place of man and his environment in the study of social sciences."—*Man*, 1923, p. 104.

exercise does expand the muscles and create new habits." Instances have been adduced of the relative atrophy of the legs and the powerful development of the arms noticed among the natives of Tierra del Fuego and of the Aleutian Islands (Paris, Tallandier). In the Flemings, we find a certain projection of the right shoulder blade and a certain fold of the skin under the right buttock, owing to the general handling of the boat hook, which is used to move the little country boats along the canals and rivers. Boas found that the different types of immigrants in the United States of America, whatever their origin, rapidly blended into a common type: even the shape of the head, long or round, was changed, and soon approached a uniform mean. This was due to the evident influence of the environment, temperature, light and food. Climate undoubtedly modifies many physiological processes in individuals and peoples, affects their immunity from certain classes of diseases and their susceptibility to others, influences their temperament, their energy and their capacity for sustained or for merely intermittent effort, and therefore helps to determine their efficiency as economic and political agents (Semple). While producing these direct effects, climate, as we have already seen, influences man indirectly by controlling the wide range of his life conditions dependent upon the plant and animal life about him.[4] Indeed, it is through the medium of the vegetable covering, the animal resources and the diverse potentialities of the soil, more than anything else, that the land influences human life.

Such recent developments of ecology in biological sur-

[4] For a succinct and critical discussion of the subject see Febvre: *A Geographical Introduction to History*, pp. 127-44.

veys as we have indicated are very important as furnishing the basis of social economics. For the *facies* distinctive of the plant and animal community of a region leaves its impress upon social life and organization by determining the nature and kind of food supply as well as the domestication of animals and the character of occupations. Thus ecology in its wider and more comprehensive application to human evolution gives us *facies* characteristic of the economic organization of temperate steppes with large herds of mammals, of tropical rain-forests, of wet rice lands, of grass moorlands abounding in sheep and goats, of arid deserts, of bleak tundras, of forested mountains, of arable lowlands, of fertile river-valleys and so on, determined by the cumulative effects of soil and climate which directly govern plant formations and animal communities and, through the flora and fauna, govern the nature and variety of industries and economic forms.

How Man Is Influenced by the Animals He Keeps.—Man cannot escape from this complex of actions and interactions whose influences reach up and down and all around. In dry regions, in the steppes and grass moorlands, agriculture is impossible and grazing assumes the dominant rôle. Now in different natural regions, man devotes his energy to different animals such as the horse, the goat, the sheep, the camel and the ox. The requirements of each kind of animal are different and these influence not merely the forms of exploitation of the earth, but also man's habits and modes of life. To raise sheep or goats, for instance, involves to some extent the destruction of the forest whose beneficent influence upon agriculture and hygienic and biological effects on the life of man are now recognized. On

the other hand the extension of cultivation causes the undergrowth vegetation to disappear and is unfavorable to goat and sheep raising. Again, man must follow his goats, sheep, horses or camels in search of new pastures; and, the richer the flocks, the more must man extend his pasture-ground and invade the limits imposed upon him by cultivation or by the forest. This cannot but react on the fixation of types of man's social life. Sometimes there is a change introduced by the development of means of communication and there is a whole series of transformations from stock-raising to intensive agriculture, the pastoralist passing simultaneously through an evolution in his social organization. Migrations are reduced, goats and sheep are admitted into upper pastures and the mountain sides are deprived, to the profit of the plains, of the natural fertilizer left by the cattle which feed there. Gradually there emerges a conflict between grazing and agriculture and between nomads and sedentary peoples, though cultivation and pastoral activity are often combined and men have at the same time gardens and herds. Each such transformation means also change in the daily-life habits of the people. There is simultaneous modification in stock-raising. The usefulness of goats and sheep diminishes. With the introduction of methods of intensive cultivation the importance of cattle increases. Cattle require an ample supply of fodder and water and thrive as agriculture prospers. Cattle are used, not only for draft purposes (plowing), but also for milk and meat. The scarcity or abundance of labor determines whether cattle will be bred for draft purposes or for milking purposes; while in some new regions animal husbandry carried on in connection with extensive farming

reacts to an outside demand for meat in quite a different way. The horse, which is essentially an animal of the steppes, serves as a pack animal or as a saddle beast. In Central Asia, the horse is rarely eaten, but mares' milk is of great importance as food, while man can do little unless he is on horseback. Where life is insecure and the climate dry the usefulness of the horse as a running animal has not decreased. In the newly-settled regions of the temperate world the rôle of the horse as a war-animal has revived, while its usefulness as a draft-animal in large scale extensive farming has further increased its importance. The camel is particularly adapted to the desert, where it serves as a pack-animal or as a saddle-animal. Thus, camel-raising holds its own in arid or semi-arid regions where great migrations are necessary. It is thus that the tending of goat, sheep, camel, horse or cattle governs man's mode of exploitation of the earth and is inextricably woven with his habits of life and social organization.[5] The economic life of the dwellers in the arctic tundras of Northern Asia is not unlike that of the cattle breeders of the grass moorlands. Their existence depends upon the supply of meat, milk and skins which the herds of reindeer supply, and they are hunters, fishers or pastoral nomads according to the stage of domestication of the deer. The Lapps, the Zyrians and the Samoyedes have thoroughly domesticated the deer. They keep dogs to guard the herds, they harness the deer to sledges, and they milk them. They migrate seasonally with the herds seeking shelter of the forest for protection against the blizzards in winter and returning to the tundra for pas-

[5] Cf. Melville Herskovits: "A preliminary consideration of the culture areas of Africa," *American Anthropologist*, Vol. XXVI.

turage in spring. Like all breeders, they live in camps, keeping to their own territory and carefully protecting the herds against their carnivorous enemies. On the other hand, the Tungus and Lamuts have less well tamed herds. Their dogs are used for hunting, not herding, and they ride, instead of driving, the animals. The Koryak and the Chukchee represent a still more imperfect stage of domestication. They find it difficult to manage the deer even in harness. Thus they combine fishing, real hunting and reindeer breeding. The possession of herds measures the stability and social advance of these peoples. Hunters and fishers are often on the verge of starvation, but the breeders thrive in the tundras of Northern Asia. For the reindeer peoples, the flesh and blood are naturally the most important food. They are clothed in reindeer skins, while their habitation also is usually made of reindeer skins. Thus the habits and modes of life of the nomads of the tundras exhibit the different stages of social development marked out by the use they can make of the herds, which also governs indirectly the mode of exploitation of natural resources. Looked at in this light, human and animal communities are systems of correlated working parts, though man's influence plays a gradually increasing rôle in the organization of Nature.

Desert Communities.—The fundamental character of agreement in this field will be more and more manifest the more we analyze the sociological side of human life in its relations to ecology. But no example of ecologic agreement is more remarkable than the reciprocal adaptation and mutual helpfulness of plants, animals and men imposed by a rigorous environment such as the desert. In Papa-

gueria, McGee has shown that men, animals and plants co-operate in such wise that the sum of vitality is multiplied and at the same time subordinated to intelligence. Under the growing cactus and mesquite which combine for mutual protection their armament of thorns which are instruments for absorption, a perpetual check upon transpiration, there grow grasses; next, small mammals seek the same protection and dig their holes among the roots, giving channels for the water of the ensuing rain and fertilizing the spot with rejectamenta. The annual and semi-annual plants which maintain a precarious existence in the desert take root in the sheltered and fertilized soil. Then certain ants come to the miniature garden for the seeds, certain flies and wasps for the nectar and certain birds to nest in the branches. In this way a community is developed in which each participant retains individuality, yet in which each contributes to the general welfare. As a consumer of seeds and fruits and as a distributor of seeds, the Papago enters into the vital solidarity of the desert and contributes towards the perpetuation of species that are good in his sight.

Collective Coöperation of Living Things.—Man consumes fruits and seeds, yet distributes the germs of plants useful to him; as he advances in culture he conserves the germs into the season of germination; he either neglects or directly destroys useless and noxious plants; and in all these ways he improves the flora. Man subsists in part on game, yet, under the economy of solidarity, he does not exterminate the game animals, and thereby cut off a supply at its source; but rather coöperates with them in a communality analogous to that between the animals and plants; he aids,

albeit unconsciously, the herbivores in escaping the carnivores, and for this service they pay tithes in flesh; he even enters into coöperation with carnivores, such as coyotes,[6] which he spares to become his scavengers, and they reciprocate by forming a seemingly half-intentional cordon of protectors about the camp or village; and in these and other ways a partial cultivation of plants and domestication of animals is brought about collectively and man enters into and dominates the solidarity of desert life. Then if peace persists he begins to transport and preserve water, and this is the germ of irrigation by which the wilderness is made to blossom, and by which both plants and animals are multiplied and artificialized. McGee contends that, while it may not be denied that the stage in collective coöperation among living things represented by the beginning of zoöculture might originate in humid areas, it must be considered infinitely more probable that the stage was reached first in the arid lands of the continents. Thus it is a paradox that in arid deserts, where agriculture and zoöculture are most arduous, there they began.[7]

[6] Cf. Native dogs or dingoes in Australia.

[7] McGee: "The Beginnings of Agriculture, and the Beginning of Zoöculture," *American Anthropologist*, pp. 8, 362-75, 10, 221-30; also Cholnoky: *The Ancient Desert Peoples of North America.*

CHAPTER VI

THE REGIONAL BASIS OF SOCIAL TYPES

Social Heredity a Feature of Human Evolution.—Modern geographical surveys show that fundamental surface phenomena impress a distinctive type of social and economic structure upon human groups of a certain region. The clue to a scientific classification dealing with different types of economic organization representing man's manifold behavior for subsistence and comfort may thus be furnished by those ecologic studies which seek to discover convergence of characters and similarity of behavior among animals or plant formations due to the similarity of habitat. There is, however, one consideration which we must bear in mind, and which serves to add to the distinctive elements of social growth-formation supplied by animal geography on a socio-physiological basis. Regional economics will supplement and in part correct the effect of isolation and segregation in the regions of zoögeographical distribution by the distinctive factor of *tradition* and a cumulative environment based on such tradition, which mark off man's social life from animal and plant evolution. Man has a history in a sense in which animals and plants have not, and this history enters as a vital factor in the form of the social heritage into the evolution of races and their regions. It is true we find the social heritage among some of the social animals. There are the hive, the ant-hill, the termitary, the beaver

village, etc., which hand down an organization secured outside the organism. But in the case of man this is much richer and more complex. While the ants and bees are hereditarily endowed with a rich repertory of instinctive capacities of a more or less stereotyped kind, man, who has a smaller number of such specialized instinctive capacities, inherits an ever-expanding external legacy, which registers his racial gains. Like animals, man instinctively combines in attack or defense, coöperates in a common enterprise, collectively migrates from aridity to favorable regions, and stores and forestalls famine, but man's traditions and institutions, which have their simpler antecedents in animal societies, are extraordinarily rich. More than the intra-organic factors, these aid man's survival and progress. The social environment in which gains are registered plays a larger part in human evolution, though this is related to the geographic environment and the physical heredity and the instincts and impulses which it furnishes. This molds the economic routine, and the latter in its turn becomes an institution which helps to mold the mind of the coming generation.

Limitations of the Environmentalists.—The classification of economic types is thus based on social and cultural factors representing the social value and tradition of a community within which the life economic is placed in an organic setting. Thus, a class system on an economic basis or a caste or group system on a functional basis expresses the social physiognomy of a particular people and represents two divergent types of economic evolution. It is, of course, true that cultural relations play an important part in bringing about changes in social and economic

organizations; for instance, when one social type is threatened by a stronger one, or when a weak or immature people is subjected or enslaved by a strong adult race. Migrations of labor also play a part in determining economic organizations, especially when they are continued in large numbers for generations, affecting the ethnic composition of the region. But the primary basis of the classification of economic types is represented by the influence of the physical environment. An arid desert, excessive cold or heat, mountainous regions, marshy tracts, etc., all serve as factors to determine economic and social organizations. The great Arab thinker and statesman, Ibn Khaldun (1332-1406), was perhaps the first to point this out, anticipating by five centuries Buckle's theory of the influence of climate, food and soil. History, Ibn Khaldun argued, should study human associations, racial elements, climatic influences, the struggle for food, the stages of civilization (nomadic, militaristic, urban) and the social attainment of intelligence, science and culture.[1] A little change in climate may change man's behavior and mode of life even in the same way as it affects plant and animal formations. This is illustrated by the part played, for instance, by malaria in the decline of the ancient Greek civilization in Greece. Changes in climate stinting or destroying the resources of a region are illustrated in the history of Central Asia, Palestine and arid America. Ratzel, in his monumental work on Anthropo-Geography, discusses fully the influences of the geographic environment, but he

[1] Dealey: *Sociology*, p. 33; also Huntington: *The Pulse of Asia.* Huntington's views are criticized in Benoy Kumár Sarkár's *Political Theories and Institutions of the Ancient Hindus.*

does not give us any classification of social types on this basis; he also neglects the internal factor of race or biological make-up. The anthropo-geographical theory can explain very well the difference in the lives of various species of animals, but is inadequate for interpreting human evolution. Indeed, neither Ratzel's zones of the distribution of races arranged on purely geographical principles [2] nor Forbenius's centers of radiant influence can supply the basis of a true scientific classification. For in sociology, as in biology, the ramification of a tree in divergent directions represents the scheme of classification which is most similar to the reality of evolution. Thus physical, ethnic, cultural and historic factors have all operated in the evolution of peoples and their regions; and, indeed, a merely geographical classification of peoples according to the regions which they inhabit will be too superficial and shallow, though the regional influences, of course, enter as a vital formative factor in the form of economic tradition into the evolution of peoples and their zones. The geographical explanation must not be carried too far. For man can overcome geographical facts in a way to which the rest of the animal world offers no parallel; but, as Marett observes: "When all allowances are made for the exaggerations almost pardonable in a branch of science still engaged in pushing its way to the front, anthropo-geography remains a far-reaching method of historical study which the anthropologist has to learn how to use. To put it crudely, he must learn how to work all the time with a map of the earth at his elbow." Ecology supplies us with the keys to social origins, and although the human mind plays a

[2] Semple: *Influences of the Geographic Environment.*

greater rôle, and the region a lesser as society advances, the impressions of the environmental upon human relations and creative activities continue to direct social progress. The ecology of individuals is Autecology; that of communities is Synecology. Man's response to the environmental factors takes the form of a communal response, not individual response, and thus comes into the domain of Synecology. This is also to a large extent true of the reactions of animals to the factors which they encounter. The animals of a community all have to adjust themselves to the environmental factors. If they meet environmental influences in the same way, they are said to be ecologically similar; if they meet the same influences in different ways, they are ecologically equivalent. Thus a caterpillar that meets low temperature by making a cocoon and one that gets the same result by digging into the ground are ecologically equivalent. The Eskimo meets the cold by building a snow house. The nomad does the same by using furs and skin, and the civilized man by wearing soft woolen apparel.[3] Petrucci observes: "A number of animals construct habitations for the winter and other habitations for the summer. This brings to light a dual fact of prosperity by which animals express their own nature in reaction or in adaptation to modifications in the external world. Examples are found all the way from crustaceans to mammals. Animals select their habitats, probably by trial and error; and their behavior becomes adjusted to the surrounding condition." In the case of human communities, the exer-

[3] Cf. an interesting article by Mauss and Benchat on "Seasonal Variations in Eskimo Societies: a study of social morphology," in *L'Année Sociologique*, 1904-5.

cise of reason and conscious selection leads to adjustment to similar environmental factors in different ways. Hence human communities are ecologically equivalent, though of course instances of ecological similarity are not absent from the history of human customs and institutions. A very interesting instance of similarity and dissimilarity in adjustment to a similar environment is afforded by the Eskimos of Arctic America and the Chukchee of Northeastern Siberia. "The Eskimos build snow houses. They are plentifully supplied with this material almost the whole year round and does it not lend itself admirably for structural purposes, its use being moreover, suggested by the natural forms assumed by the snow? The Chukchees, however, do not build snow houses. Instead, they build their large tents of hide over heavy wooden supports, and drag these along in their frequent migrations. Again, among the same two peoples, reindeer are available in large numbers and both peoples do indeed make use of them. But in what way? When the Eskimo needs a reindeer, of which he eats the meat, uses the hide to line the outside of his *kayak* and the inside of his house and uses the horns to form an essential part of his sledge, he goes out and kills one with his bow and arrow. To drive his sledge he uses dogs, but he has never domesticated the reindeer, a much faster and stronger animal. The Chukchees, on the other hand, have achieved and use the reindeer to draw their sledges."[4]

Distribution of Economic Objects and Pursuits.—Goldenweiser studies the geographical distribution of industries and of objects of material culture and finds that some eco-

[4] Goldenweiser: *Early Civilization*, p. 295.

nomic pursuits, objects and inventions are distributed over vast continuous areas, others in less vast and discontinuous ones, while some articles or processes prove indigenous to small districts. He illustrates: The bow and arrow is found almost everywhere in the primitive world, excepting only Australia; but particular kinds of bows, shapes of arrow points, methods of attaching feathers to the arrow (if there are any), or ways of releasing it, differ from district to district. Agriculture is distributed in America throughout wide areas, but is by no means universal; it is carried on in Africa almost throughout the enormous expanse south of the Sahara and north of the desert of Kalahari, excepting only in some large, thickly-wooded districts; it does not occur in Australia, and is found only in the form of garden culture in Melanesia and Polynesia. Tents are found in many places, but the *tipi,* with its peculiar shape and construction, is at home in the Plains and some adjoining areas. Similarly the bark house (as among the Iroquois), the earth-lodge (as among the Omahas), the adobe pueblo of the South-west, the gabled board house (as among the North-West tribes), the snow house (of the Eskimo), and the semi-subterranean house (as among the interior Salish of British Columbia) all have their areas of distribution, with considerable overlapping. The distribution of African huts reveals a similar situation. Some types of dwelling are rare and peculiar to restricted localities; as, for example, the pile dwellings of Northern Melanesia and New Guinea, or the tree-houses—houses built among the branches of trees—of some Philippine tribes or the African natives about Lake Chad. When a tribe strikes a new physical environment, it works out an adjustment to the

latter by means of a set of economic pursuits and of objects and processes of material culture.

How Man Reacts to Environment: Behaviorism.—In early civilization every tribe utilizes in its material culture at least part of its physical environment, and also depends, as a rule, on its own physical environment more than on its contact with other tribes. When an adjustment to the environment is made, an equilibrium is established which is not easily upset. The material culture of a tribe then develops a decided aversion from changes or even improvements, whether these originate within the group or are brought in from the outside. Also an adjustment of this sort tends to spread beyond its original home, following the lines of relatively similar environmental conditions. Beyond this its spread does not extend excepting in the form of individual features which, as shown above, move about with considerable freedom.[5] The same phenomenon is found in the life of primitive man, especially in the extreme north, where the differences between summer and winter are so pronounced that each season requires a special adaptation. Among animals these adaptations may bring about a hibernating period. Man, however, takes positive measures to combat these climatic variations. These measures for the greater part of the world take the form of changes of dress. Such matters of agreement of primitive communities in different parts of the world are brought to light by the ethnologists. On the other hand, advanced communities are seen much more to react to different environmental complexes

[5] Vide Wissler: *Man and Culture;* and "Aboriginal Maize Culture as a Typical Culture-Complex," *American Journal of Sociology,* Vol. XXI, 1916; also Lowie: *Culture and Ethnology,* chap. ii.

in different ways. This reaction is primarily not an organic change but a behavior response. Anthropologists agree that while man once ran into a number of species—and of genera—now all living human beings belong to the same species and even the races show marked signs of being in process of becoming swamped by intermixture. The difference in human communities is found chiefly in specificity of behavior: "The parallelism between the geographic phenomena in animals and the relation of culture to environment lie not in the color and structural adaptations of animals but in the behavior characters of animals which enable them to live under a given set of conditions, and the behavior which these conditions produce." In the case of human communities, the specificity of behavior response would include the adjustment with regard to food, water and shelter, the materials which they use and the tools with which they transform them, the animals which they train and the type of material wealth they value, etc., which all bear the impress of the environment much more than their color and [illegible] modifications. Thus, the culture and mental make-up of the human community represent a response to the environment, which is quite different from the responses and changes in plants and animals, such as direct structural modifications, and once again makes evolution possible and this time in greater richness and complexity. Semple says: "The contrast between the Mongol Tunguses, who lead the life of hunters and herders in Arctic Siberia, and the related Manchus, who conquered and rule the temperate lands of China, shows how climates help to differentiate various branches of the same ethnic stock; and this contrast only

parallels that between the Eskimo and Arctic offshoots of the American Indians, the Norwegian and the Italian divisions of the white race."

Isolation Essential to Social Differentiation.—Just as, in the case of the animal, isolation is necessary before an incipient species can become fixed, so in the case of human communities a measure of protection from the inhabitants of neighboring areas—a measure, that is, of isolation—is essential before a social type can develop. This is best seen either in rigorous regions or in areas of uniform characterization, where there are immense expanses in which people live together more or less in isolation, and where mountain ranges or other barriers bring together some groups and separate them from others. Here each ethnic layer, like a particular species of plant or animal, may react in a particular way and possess a definite plasticity, which may vary in degree and direction but comes to take something of the common character of the type group. Thus there is such a thing as a "climatic climax" in the distribution of institutional forms. There is a noticeable tendency for things and ways of making or using things to become grouped in sets within certain regions. Furthermore, in the case alike of plants and animals, we know that where the local conditions are such that the incipient species is limited to a very narrow area, there high specialization may occur, as, for example, on many islands, or in isolated mountain chains; but that specialization is associated with the loss of the capacity to vary, to acquire adaptations fitting the organism for a wider area.[6] So in the

[6] Cf. Wallace: *Island Life;* also Cuenot: *La Genèse des Espèces Animales,* which sets out the infinitely varied consequences of isolation—endemism,

case of human communities, where the isolation is too complete, the power of adaptation tends to be lost, and such groups, though their civilization, along its own lines, may be of a specialized type, are easily overwhelmed when contact with the outside world does occur, just as island animals tend to disappear before introduced forms (Newbigin.)

Data and Scope of Regional Sociology.—To establish sociology on the basis of a scientific classification of types, there is therefore need of the consideration of local and regional data, particularly the minute observations of contrasted economic regions. Sociology will then proceed to formulate the principles of man's effort and modes of occupation and utilization of the earth independently of local and regional descriptions. It will thus unify two movements. First, it will always have a provincial, national or regional tendency; second, it will aim at principles of general or universal validity. Bearing in mind the above aims, it starts from the natural region, a fundamental and easily distinguished unity, for an analysis of the relationships between geographical conditions and economic facts. Following an experimental biological method, it selects a few examples as types to indicate the relations connecting the essential social facts with the fundamental physical conditions with which are associated the same types of vegetation and animal life: which, indeed, serve as a frame and solid base for a complete study of life in all its stages and types.

scanty population, persistent archaism and nanism. The effects of isolation on primitive societies are illustrated by the peculiar culture of the Andamanese, the aborigines of Australia, the Tasmanians, and the Ainus in the island of Hokkaido.

Social Types Corresponding to Regions.—The great climatic regions of the earth, such as the extremely cold or extremely hot deserts and semi-deserts, the hot, wet equatorial belt, or the warm, dry trade-wind belts, or the cool, well-watered temperate zones, constitute, through the medium of their economic products and their climatically imposed methods of production, so many socio-political regions regardless of ethnic and political boundaries. The Berber nomads of the Northern Sahara live much as the Semitic Bedouins of the Syrian desert or the Turkoman stock of arid Turkestan. They have the same tribal government, the same scattered distribution in small groups, the same economic basis of subsistence, though of different races and dominated respectively by France, Turkey and Russia. Similarly, both the Bedouin and the Lapp have domestic animals which provide food, clothing and transport—the camel and the reindeer respectively; moreover, both have staple foods—dates and fish, respectively; both are nomads, though the one wanders mainly on other peoples' business and the other for his own food; both are traders, though the one collects furs on the outskirts of the world, while the other trades through the heart of it to rich lands on either side; both depend very slightly on outside supplies and despise the slavish tiller of the soil (Lyde). The harsh conditions of life have imposed upon all the arctic folk a similar civilization. All population is sparse and more or less nomadic, since agriculture alone roots settlement. They have the same food, the same clothing, the same types of summer and winter dwellings, whether it is the earth hut of the Eskimo or of the Coast Lapp, the Siberian Yukagirs of the Kolima River or the Samoyedes of

North-Eastern Russia (Semple). Careful investigations have been made of life in the great mountain plateaux and the same fundamental arrangements and often the same appearances have been found despite the diversity of place. Thus in the Pyrenees, in regions of like altitude and geographical conditions, we have a doubling of agricultural levels and a corresponding doubling of habitations; a combination of a precarious and restricted agriculture with a very full and compelling pastoral life, and with a more or less temporary and unimportant industrial activity; the seasonal rhythm of life oscillating between a summer and a winter state; a corresponding alternation in establishments, houses, stabling, sheepfolds and barns; constant autonomy of groups, respect for tradition, attachment to the native soil and a limited outlook. A similar state of things is found wherever analogous geographical conditions are reproduced, as at Transhumance in the Carpathians, where it has been studied by M. de Martonne. The rhythmic change of life, according to the seasons, was observed in the valley of Annivers by Brunhes and Girardin; and the staging and variety of forms of dwellings have been described by Marinelli. Sion in his work on Southern Tibet also has described the relations which the movements of the cattle bring about between the slopes of the Himalayas.[7] In the sparsely peopled plateaux in the Himalayas where scarcity of subsistence has been of great consequence, it is noticeable that marital license has been left unpunished. Similarly, the conversion of the Mongols to Buddhism shows how religion played its part in the limitation of births and took the place in the arid lands of Central Asia

[7] Febvre: *A Geographical Introduction to History*, pp. 196-7.

of those physiological precautions known in the wastes of the Sahara to the Tuaregs.[8] Polyandry and polygamy have been tolerated where there is a disproportion between the sexes. So too, in a different aspect, density of population has affected legal principles concerned with vicinal life—such as partition of estates and servitudes. In regions densely populated, there is more solidarity and fraternity, unless the human pressure becomes so intense that a pitiless egoism rules, as in the ancient Chinese and Hindu custom of the abandonment of infants, and the abortion of our own day. Conversely, the prevalence of sterile marriages of a decadent period have led to legislation aiming to stimulate the increase of population.

Life Amid Tropical Luxuriance.—The tropics make labor unnecessary, and the heat and the natural supply of food tend to make man lazy and unambitious. The woman here is less dependent on her mate for maintaining herself and her offspring, and hence sexual relations are loose. Abundance gives an early impulse forward in civilization, but later retards it by restricting economic methods to the lowest stages of development. The extreme luxuriance of tropical vegetation, the formidable size of the trees, the tangled undergrowth forming "an obstacle as pliant as it is resistant," as well as the terrible plague of the insect, which is the real ferocious beast of equatorial regions, and the most to be feared, make life extremely difficult. Thus the fertility is more apparent than real. Speaking about equatorial Africa, Dr. Cureau observes: "The thick roof of foliation, always green, crushes you, the heavy and stale humidity overpowers you, the green gloom tortures you."

[8] Cf. Gautier.

He points out the contrast between the man of the plains and the man of the woods who leads the precarious, suspicious life of a perpetual recluse in his obscure dwelling under those gloomy vaults, and, when drawn from his haunt and brought into the light of day and the open country seems as dazed and uneasy as a bat blinded by the light. "Nature refuses him the first necessity of life, food; since the trees bear their fruits at inaccessible heights and hunting in the forest is a lottery. She refuses him the sun, the source of health and good spirits. There is not a blade of grass to rejoice his sight, nor even moss for the repose of his weary limbs." Thus in Central Africa, we find a perpetual state of semi-famine on a virgin soil which abounds with life and productiveness, and the natural products of the soil, the tubers, which are "famine," are consumed by the people living under a permanent régime of hunger. Cannibalism also persists there, the cannibal feasts being often a real sustenance to the famished.[9] But the intertropical lands are not all forest. There are open spaces and brushwood clearings where agriculture is possible, though in a rudimentary stage, and some meager fields of manioc, sorghum, millet and sweet potatoes rise. Rudimentary or nomadic agriculture, like hunting, produces only the small, weak, loosely organized horde. The settlements of the Negritos in the Andaman Islands, for instance, are very widely scattered, for, in lands of tangled jungle, concentration would ruin the hunting just as it would the fishing. Where agriculture begins, it is rarely permanent. In parts of the East Indies, for example, Sumatra, Borneo, the Malay Peninsula and in some parts of Burma and Indo-

[9] Cureau: *Les Sociétés Primitives de l'Afrique Équatoriale.*

China, upland rice is grown under a primitive system of migratory agriculture. When a new rice field is wanted, the people of a valley begin the year by cutting down the forest. Among stumps and prostrate logs, often higher than the worker's head, the upland rice is planted in holes made with a sharp stick and filled by the bare foot. Since young rice is much prized by wild animals, the elephant and the small rodents being alike partial to it, the clearing must be watched until the harvest. After two crops of this upland rice are taken, the field is abandoned for a fresh field and the tangled jungle promptly recaptures the land.[10] Thus the unending heat and moisture of the equatorial belt, which promote the continuous growth of vegetation, baffle any attempt to possess permanently a tract of ground, and hence do not allow a stable economic organization to develop. Gradually, with the development of stationary agriculture, large permanent village communities are established and the generous means of subsistence encourage an elaborate organization in the use of the land, the development of handicrafts and systematic trade between neighboring tribes. But the enormously heavy rainfall, with even temperature and tropic sun the year round, produce all the food that is needed, and the people feel that they have all that they really want and know how to use. Their dwellings, for instance, are built from wood and

[10] Russell Smith: *The World's Food Resources,* p. 94. Febvre rightly observes: "We cannot deduce the advantages and disadvantages which a country offers for human groupings by merely considering its zoölogical or botanical density. There are certain plant and animal surroundings which prevent men from playing an active part; they cannot successfully invade a botanical or zoölogical region to rearrange it, organize it, and adapt it to their needs, unless they first of all establish certain supporting posts favorable to the free development of their efforts."

bamboo or other perishable materials. They hunt wild game, which is abundant, and catch fish whilst paddling on the rivers in their primitive canoes. Their domesticated animals are the water buffalo and the hog. With the migration of new tribes, the first settlers are driven back into the great forest, where they continue to lead their old life. The tropical jungles are thus the retreats of the Negritos, who have scarcely advanced from the state of our Neanderthal ancestors. The new settlers, who occupy regions more fertile or offering better health conditions than elsewhere, represent a more advanced stage of civilization. But there is something hypnotic in the vast tropical plains. Individuality dwindles and flickers out; there is complete subjection of man by nature, in spite of her plenty. It is shown, for instance, by the exacting tasks demanded of both men and women in growing rice in the flat basins of the Asiatic tropics, as described by a traveler: "Great blue-black buffaloes wallow knee-deep in the inundated fields, churning the ground into readiness for the first rice-planting. All the wide area is dotted with mushroom hats bent far over in the back-breaking task of setting out the young shoots. These are being transplanted from tingling green seed-beds, the solitary bit of color in a sad expanse of dyke and water. Everywhere artificial irrigation is going on. Women stand facing each other in pairs, swinging a deep bamboo basket by ropes held in both hands. With one movement of their arms they drop the basket into the irrigation ditch or reservoir, swing it upward and empty it into the field with another, and then let it drop back again with mechanical precision. Over the rice-terraced land now and again break heavy storms, beautiful to look at

from behind train windows, but disastrous and lonely for those who were without; when the rain stops the sun again chastises the land and makes the watery fields glitter intolerably. In the great sharing of common toil and common poverty, there are no longer any people, only earth-bound workers." The above picture is true of the muddy, inundated fields of Southern Burma and Malabar. In the latter regions the Ezhavas and the Puleyas are the survivals of the Negrito population, and engaged in most exacting tasks of wet-rice cultivation at exceedingly low wages.

Complementary Trade Regions.—Tropical zones, including various rain and monsoon forests, are distinct entities and play a rôle no less, and perhaps in some respects more, important in the economy of the peoples living in the cold and temperate regions. Semple observes: "Nature has fixed the mutual destiny of tropical and temperate zones, as complementary trade regions. The hot belt produces numerous things that can never grow in colder countries, while a much shorter list of products, coupled, however, with greater industrial efficiency, is restricted to the temperate zone. This explains the enormous importance of the East Indian trade for Europe in ancient and medieval times, the value of the tropical plantation system in the Dutch East Indies and republican Mexico, as formerly in the sugar and cotton fields of the Southern States, with its relentless grip upon the throat of national life in hot lands. Contrasted regions develop degrees of economic efficiency and density of population. Hence they gave rise to great historical movements in the form of migration, conquest, colonization, and commerce, which, like convec-

tion currents, seek to equalize their differences and reach an equilibrium.'' There is thus an underlying biological unity of the earth, which expresses itself, however, in diverse environmental growths, the coöperation of which is essential for world-economy. Unfortunately, the scientific recognition of the value of variety and divergence, in human associations and communities, is lacking; but, in economic practice, this has been found essential for the exploitation of natural resources and the production and exchange of raw materials and financial commodities in the world.

Food Supply and Social Progress.—Social activity has been approached from the standpoint of food, showing how social life is determined by the conditions of food supply, e.g., hunting, fishing, domesticating animals and sowing seeds; by the nature of staple crops, e.g., wheat, rice or Indian corn, involving different types of labor, by the scarcity or abundance of food; or, again, by the kind (with special reference to the relative amount of protein and starch consumption) of food, whether animal or vegetable. Already there are studies showing the physiological or psychological effects respectively of a flesh or vegetable diet, or of wheat as against rice, for example, with the implication that there are social consequences according as national diet is chiefly the one or the other. Boas discusses the influence of environment upon human types, and shows by modern measurements how climate, food and labor have registered their effect. Then, too, the relative ease or difficulty of obtaining food determines number, stability and possibilities of division of labor and organization. Woodruff insists that the conditions of food supply

are the determining factors in social progress, for food supply determines the size of the population, and the pressure of population upon food supply is the immediate stimulus which gives rise to invention and discovery and all control over nature.[11] The simple equation of food and population offers, according to him, the solution of the enigma of progress.[12]

Sociological Importance of the Struggle for Food.—The relative scarcity of food in proportion to the population tends to develop a disparity of wealth and opportunities, and a social gradation based on economic power. The struggle for wages under such conditions gives rise to a characteristic economic system. Wage slavery or ethical competition, industrialism or rural communalism and Marxism or social determinism may each be traced to the influence of the nature of the struggle for food or wages, which gives to the average man in one environment mere food and shelter in return for daily toil, in another ample subsistence. Increase of population and pressure on means of subsistence lead to conflict of interests, separation and migration on the one hand, and, on the other, to new adaptations which give rise to superior ways of coöperating, so that an adequate and stable supply of food shall be assured. Island peoples, for instance, who have limited land resources, thrive by trade and colonization, and their dependence on outside sources of foodstuffs tends to develop an aggressive, even exploitative, industry and commerce. The conflict of group with group over a common food supply has been an important factor in integrating groups. Social collectivism

[11] Woodruff: *The Expansion of Races.*
[12] Ellwood: *Sociology in its Psychological Aspects.*

appears early, for instance, among those desert nomads who take to agriculture in order to escape from their hard lot. In the oases dams are built and wells dug, gardens spring up and the most highly perfected cultivation is the outcome of an elaborate social control. The main canal belongs to the community, and all who have worked to increase its producing power have a share in it in proportion to their work. No one owns land and water. The only thing that can be considered property is the tree, and particularly the date palm. Each owns what he plants, and the ownership of the tree brings with it the use of the land. On the other hand, he who has no tree, has no land and can dig no well. Thus everywhere the development of private property, the division of labor and the rise of classes are conditioned by the relative abundance or scarcity of resources of the region. In the forest areas, the rise of property in things other than weapons and ornaments accentuated group conflict. In the temperate zones stability in respect of food supply through the possession of flocks and herds was an essential guarantee against unfavorable seasons, but these encouraged systematic and continuous group conflicts, which since have played a leading part in the social drama. With the spread of capitalism, the exploitation of new lands and the conflict between culture groups for the possession of the earth have assumed a world-wide significance.

How Rice Culture Develops Communalism.—Where, on the other hand, food supply is easy, but not so abundant as to discourage economic initiative, as illustrated before, there is less conflict and warfare, and we see the beginnings of that sympathetic communal life of which the village

community has remained the highest type and which has become the conscious goal of communalism. Social collectivism here has been the result not of the scarcity of water as in the oases, but of the need for a collective regulation and distribution of rain or irrigation water among the level basins where the wet-rice is grown. These must be watered and drained at fixed periods under careful supervision and equitable collective discipline. The chief crop of the monsoon region is rice, the cultivation of which requires a larger supply of hand labor and throws a greater strain on it than does any other form of cultivation. Rice therefore can be cultivated only in densely-populated regions. The transplantation of rice involves squatting for days and weeks in water, painfully setting individual plants in the mud, an inch or two apart. The fields have to be flooded by connecting them with irrigation channels, and once the fields are flooded there must be no cessation in the work of transplanting, which continues from the first streak of dawn to late in the evening. If the water dries up, the young plants are killed, and also they die if the water should rise so as to cover them entirely. Thus rice-growing develops communal habits of agriculture and communal control of irrigation channels. For these alone can ensure that careful and equitable distribution of water without which agriculture becomes most precarious. Even the "hill rices" are raised on fields that are flooded in the early stages of growth—a condition secured through terracing and banking up the lower ends of the plots of land, so as to retain the water of the spring rains or melting snows. Some of the primitive peoples of the Himalayan ranges exhibit great skill in terrace agriculture and

coöperative work. It is economic necessity, again, which thus encourages association of labor and social discipline in certain directions. This has contributed to maintain the economic and administrative organization of the rural commune throughout the monsoon region.[13] In both India and China, in spite of the pressure of a dense population and exhaustible soil resources, this collective life has been maintained by a wide diffusion of land among peasant owners, a careful communal regulation of private property rights and an encouragement of charity, both public and private, which have hardly a parallel anywhere else. Communal rights and property are emphasized along with the obligations of wealth and talent, and, instead of the class system based on economic interests, we have here functional groups knit by social and cultural ties. Society develops by accretion and assimilation rather than by conflict and absorption; there is a steady process of socialization which coördinates the diverse social groups and establishes stable relations between the members of the group and its life conditions. All this shows a definite connection between scarcity or abundance of food and the nature and kind of social evolution. Government and many other institutional forms of social life also exhibit as divergent types as do economic forms and organizations.

[13] It may be of interest to note that Vidal de la Blache suggested long ago that the cultivation of rice, by the abundance of nourishment which it produces in small space, as well as by the perpetual care which it requires, exercises a profound influence on the societies of the Far East. He observed: "I must be careful not to generalize overmuch; but if, in these societies of the Far East which centre round China, a strongly constituted system of family and village is really the corner-stone, we see the relation of cause and effect between the method of cultivation due to the geographical conditions and the only truly popular form of organization which we find there."

Diversity of Social Evolution.—Adjustment of the arts of production is, in short, comparable to the adjustment of animals with regard to food, nestbuilding, materials used in nestbuilding and other features of ecology and behavior, which therefore offer the methods for a study of the distribution of institutional forms in different social types. Ecological economics would seek to trace the development of different types of economic organization and of labor arising out of the process of adjustment through the effects of physical factors and through formation of habits, instincts and associations therewith correlated. To be sure cultures have migrated and ideas and customs have been imitated and absorbed; but social, like biological modifications, have generally followed the line of least resistance, i.e., in this case, adaptive assimilation. The cumulative tradition of the race and region has thus marked off man's life into broad social and economic types corresponding to the Regional Geography, to which the social and psychical factors are adapted and correlated in the course of evolution, producing diverse multi-linear series in different cultural zones.

CHAPTER VII

PROPERTY AND VILLAGE COMMUNITY UNDER DIFFERENT REGIONAL CONDITIONS

Region and Ownership.—The physical characteristics of the region where people rove like herds of herbivorous animals in search of pasturage or where they can congregate and form agricultural groups of a permanent character mold the notions of ownership as well as the economic basis of social relationship. In the grasslands, there is only group ownership. Among the Yakuts private property hardly exists; even the house is regarded as common property. In regions of scanty resources the nomadic group has a cantonment limited by its surroundings. Sometimes the territory is limited by the presence of superior peoples who are around them and who keep them confined to a certain habitat; and sometimes this territory represents a positive idea of possession which nomadic tribes assert against occupation by others. In the more fertile parts of the Sudan, the recognized limits for grazing tend to be ignored, but in the more barren regions trespass is a frequent cause of tribal fights. We find such phenomena alike in the human sphere and in the animal domain. Some of the mammals, such as the *equidæ* of the steppes of Asia and Africa, rove in bands of greater or less numbers and continually range over a widely extended terrain in search of pasturage. They never remain anywhere for a fixed period. But there are others, *e.g.*, the horses of the pampas,

the bison and the elk, which become identified with a definite territory where they possess the domain occupied, either in a permanent or temporary aspect, and change their residence only when its resources have become exploited or exhausted.[1] Pastoral ownership similarly focuses now about a well-watered old glacial delta in a rapidly drying plateau, as in the case of long-buried cities so recently brought to light in Eastern Turkestan; now about a spring in a desert, as in the Arabia of the nomads; now about a well, as in the Western Panjab; and again about a clearing in the pasture-land or a cluster of date palms easy to defend, on the edge of an arid region.[2]

Primitive Land Ownership and Tenure.—Thus are the great desert tracts and steppes dotted by the encampments of the pastoral owners, and between their scattered encampments at any time are wide interstices inviting occupation by any settlers who can make the soil sustain them. There is some sort of adjustment of the needs of different tribes by the allotment of pastures, but overcrowding by men or livestock puts a strain upon the social bond. When population increases and the climatic conditions may favor superficial tillage, property develops, but not without difficulty. The first feelings of property and of a home soil are evoked by a few plants or trees, protected by a hedge or a fence or a wall; but it is the labor of reclamation and irrigation by wells or watercourses which firmly establishes

[1] Petrucci: *Les Origines Naturelles de la Propriété: Essai de Sociologie Comparée.*

[2] Gautier observes that every oasis in the Sahara is a kind of prison. The desert-dwellers are bound to their palms as securely as if they are chained.

property as an institution.[3] In a dry and sparsely populated region, where the pastoral tribes seem to contend with the agriculturist for possession, labor, capital and property jostle together, and the combinations are abnormal. The property or dominion of the soil is of little use, if there are no strong arms to till; the proprietor and the cultivator can do little if there is no capital forthcoming to sink the well, or supply the agricultural necessities. Each element must do its own duty and receive its own benefit. Thus we find the rent charge paid to the capitalist, if property remains *in situ,* and has only to pay tribute to capital, or the quitrent, if capital has ousted property and doles out a miserable compensation for a lost inheritance. Or again we find property ousted by labor, and the man that is able to till the soil holding his own against the descendants of a hundred ancestors who cannot do so, and are content to take a quitrent and give place to hardier industries. Again, we find the tenant, representing labor, possessed of privileges unbecoming his position, paying little or no rent, simply because the gross receipts provide little or nothing more than the expenses of cultivation and the revenue of the sovereign, or because labor is scarce.

Water Ownership and Tenure.—Sometimes we find that the water rather than the land is the subject of careful partition and of a regular tenure on well understood conditions. This is the characteristic feature of the tenures in the North-West Frontier Province and in the districts in the South-West of the Panjab. In early tenures it is not so much the soil that is regarded as the subject of owner-

[3] Cf. Richtofen.

ship as the produce. This may be the case, especially, where land is abundant and of little value until laboriously cleared of tall grass and jungle. A similar feeling regarding water arises in cases where the land, without means of irrigating it, would be absolutely useless. The principle of distribution depends on the amount of water available. When there is more than enough, every one extends his cultivation according to his means, and then gets water for the whole. But where the water is not superabundant, it is divided according to the inheritance-fraction which each holder represents in virtue of his place in the genealogical tree. Water-shares are in some cases (where the supply is very limited) sold quite independently of land. Thus, a man may have a piece of land dependent on rain only for its cultivation, and he may then buy a water-share, or do labor and service to acquire it. Naturally such customs arise where cultivation is possible only by the aid of rainfall, but is so inferior, as well as uncertain, that an irrigation share is really the right which possesses the greater value.[4]

Water-Sharing Methods and Customs.—Baden-Powell observes: "The water-sharing involves two different matters: one, the fixing of the shares of the water-supply to which each holder is entitled; the other the regulation of the customary means by which the water is distributed. The latter may be 'heads,' one above the other, for leading off the water from the stream; or by a system of dams and dykes by which the whole or part of the stream is turned for a certain time on to a man's land, the dams being then broken down. Sometimes dams are made of a

[4] Baden-Powell: *Land Systems of British India*, Vol. II, p. 643.

certain height so that when the water exceeds a given depth the surplus must flow over the dam." In many places on the North-West Frontier there are curious customs depending on the use of water in streams descending from the barren hills which fill only when a rainfall occurs. The successive rights to take the water, and the time during which it is to run on to each lot, as well as the dams to be maintained and the height above which they must not be piled up, are all regulated by custom. In the river-villages on both sides of the Indus in Sind and South-Western Panjab, cultivation is possible only within reach of the rivers, i.e., where either a canal can be made, or the subsoil is moist enough to enable a well to be sunk to a reasonable depth. A chief or settler gives up strips of land which are the sites of the new canals and induces settlers to dig canals and sink wells and cultivate, and exacts a peculiar sort of fee or rent from the villages. The *Jagirdars* used to maintain the canals by forced labor. Now they are liable to a rate called *haq-abo* (water-right) for clearing and maintaining the canals that water the estate, the work being done by the Irrigation Officers of the Government. On canals, the water is sometimes available by flow and sometimes by raising with a Persian wheel. The term *charkha* —the area irrigated by one wheel—here denotes a common land measure, and *harlo* is half a *charkha*. In South-Western Panjab the area watered by a well and the number of wells in a village are similarly a matter intimately connected with land customs and sharing among co-proprietors. A person has a fraction of a well—a sixteenth or half perhaps—or his land is otherwise estimated, and he has a share in the water, represented by so many turns at

working the well in the course of a week or other stated time. Such owners of wells or occasionally of irrigation channels, constructed at their expense in land belonging to others are called *chakdars, silhadars, tarradadgars* or *kasur khwars.* They all possess hereditary and transferable rights both in the well or the irrigation channel, and in the cultivation of the land irrigated from it, but may be bought out by the proprietor's repaying the capital they have expended. They are generally entitled to arrange for the cultivation, paying a small fixed proportion of the produce to the proprietors, and being responsible for the government revenue. Sometimes, however, the management of the property has been made over to the proprietor, who pays the government revenue, and the *chakdar* receives from him a fixed proportion of the produce called *hak kasur,* or a third party may manage the property, paying the revenue and *hak kasur,* out of which the *chakdar* pays the proprietor's allowance. In Rawalpindi also there is a small class of well-proprietors in the position of middlemen, paying cash rent to the owner of the land and receiving a grain rent from the cultivator.

Wells as Units of Property.—Another very interesting instance of property and village community centering around wells may here be adduced from the district of Multan. While regular village communities were frequently found in the fertile lands fringing the rivers, all trace of these disappeared where the cultivation was dependent on scattered wells beyond the influence of the rivers. Here the well was the true unit of property. The settler who sinks a well becomes owner of half the well (i.e., well and land watered from it) while the landlord

acquires the other half. Or, again, the settler, instead of sinking the well himself, gives his land to a tenant, who sinks the well. In this case the latter becomes an inferior proprietor. Thus there has grown an army of rent-receivers and rent-payers on the basis of rights in the well primarily, and secondarily in the holdings watered from it. Where the proprietors of several wells lived together for mutual protection, or their wells were sufficiently near conveniently to be included within one village boundary, the opportunity was taken at the British Settlement to group them into village communities. These arrangements were made possible by the circumstance that the village community system admits of any amount of separation of the property of the individual proprietors, and by taking care that in the internal distribution of the revenue demand it should be duly adjusted with reference to the resources of the separate holdings. They also in general involved the making over, in joint ownership to the proprietors of the separate holdings, of waste land situate within the new boundary, in which no private property has previously existed.

Water-Sharing and Human Solidarity.—In other parts of the world also we find men living in arid territories exploiting the water by means of an effective collective organization. Brunhes observes: "When men living in arid territories once wish to devote themselves to cultivation and seek to exploit the water they cannot but submit to that effective solidarity which water often imposes upon them. In several cases where the exploited water is furnished to them by single source (spring, stream, canal or reservoir) and where this exploitation of the water has led

them to ease and prosperity, they have clearly understood, or at least definitely accepted, this necessity of the collective union of individual interests." In summer the heat renders the cities of the Mzab almost uninhabitable, so that people betake themselves to oasis settlements, moving *en masse* in a single, moonless night when the edict for an exodus is given. Formerly, temporary shelters were used, but now permanent shelters resembling those of the city have been built. Ancient and precise regulations are in operation for its management and distribution, and thereby is created a solidarity and democracy that counteracts the city tendency to hierarchy. Furthermore, the garden villas are larger than the town houses and accommodate the kinship group. Seeing the spaciousness of the gardens, once access is gained through the heavy wooden doors like those of town houses, one would have no idea of the state of subdivision that exists: single palms are not infrequently the subjects of special property rights, but the irrigation canals are common property.[5] In different regions the recognition of this common interest leads to those admirable "hydraulic communities" of Valencia or of Msila; sometimes, as in Egypt or the Panjab to-day, the State is led to coördinate the interests of individuals with more or less skill. All this brings about an adjustment of the rights in land and water distributed amongst the different classes who exploit them which is far different from that in forest areas or in fertile river valleys.

Feudalism and Agriculture.—In scattered settlements in forests where clearing has just begun, the need is felt above all of leadership and protection against raiding. It is to

[5] *The Geographical Review*, July, 1924, p. 478.

safeguard whatever wealth they have that the holders of small property commend themselves as vassals to the protection of some one more powerful than themselves. Conversely, it is the economic and military necessities of the lord that make him only too glad to accept the services of his vassals, who work his land for him and join him in common offense or defense. Agriculturally speaking, the moderate fertility of the deforested lands permits only a primitive agriculture. Fallowing is very widely practised, and forest settlers are ever on the march to new woods. Herein lies the genesis of feudalism, which, while affording necessary protection, checks the natural tendency of the cultivators to abandon exhausted lands and move on to new ones. The relation between the overlord and the serf, viewed in this light, is thus a necessary phase in the evolution of agriculture. It has survived wherever the agricultural settlement partakes of a half-pastoral character and the half-barbarian cultivators have not yet been weaned from their *Wanderlust*. For the origins of feudal landlordism in India we have to go to the numerous tracts of forests in the Central Provinces where estates known as feudatory or *zamindari*, or by other names, represent service grants of the old Dravidian Gond chiefs. The original settler assumes the position of the *gaontiya* who pays a *nazar* to the *raja* or landlord, and collects certain dues from other villagers which he distributes over the village holdings. In the Chota Nagpur territories, in Coorg, Cochin and Travancore, we find a similar distribution of chief's estates which are embraced within a feudal system, the chief being regarded as sole proprietor of his own tract and superior proprietor of others in which lesser

chiefs, headmen, grantees or farmers are found who are held to deserve the sub-proprietary status. This presents a striking contrast with the equalization of rights associated with intensive agriculture and peasant proprietorship in the densely-peopled river-valleys, where the competition is not for men but for land, and where a compact local life is incompatible more or less with subordination to a chief or ruler. In Northern India, the Rajput maintained a sort of feudal organization, and its relics are still found in the *taluqdaris* and joint villages of the North-Western Provinces and Oudh, North Bombay, and among the Kathiawar chiefs. The Mahrattas and the Sikhs also developed a quasifeudal order.

Fertility and Civilization.—Even to-day, in numerous forest districts, the formation of new villages as a result of the enterprise of an aboriginal emigrant is still to be seen; and this is responsible for the origin of a large number of village estates throughout India, both the chiefs' estates which survive and the king's domain which now has become the government land. In fertile valleys, however, village communities grow up, as in the Indian and Chinese level plains, partly on the newly-developed emphasis upon coöperative methods in a more improved type of cultivation, partly on the necessity of harmonizing the claims of the "Haves" and the "Have-nots" in a dense population and partly as the adaptation of agricultural usages to the physiographical conditions so that a small area may support a huge population. Along the rivers, where population and cultivation attain a degree of permanence, "common land" exists, and regular village communities. As we retire and approach the bar or barren dorsal ridge, we

lose all traces of these communities. In the South-West Panjab, for instance, each well has its separate hamlet or hut, with no common land, interests or homestead, no ties of race, religion and kindred. But this is just what we would expect; these people are the pioneers of civilization, squatters in the primeval forest. Gradually, however, the ramparts of a municipality will be formed round them; they occupy a defined village area and a joint property in the jungle, to the exclusion of others. The owners of patches and wells are represented by headmen, the ties of fellowship and mutual advantage will draw the cultivators together and the law of joint responsibility will bring with it the right of preëmption.

Population and Property Regulation.—With the increase of population and the consequent economic stress, there is a necessary delimitation of individual rights as regards waste, meadow and forest. At the same time, arable land is distributed as widely as possible and the farmers become equal co-sharers. The fields, the clearing of which has required much labor, become individual hereditary property, while all other lands are held only in temporary possession so long as the system of shifting cultivation prevails. With more intensive cultivation, the right becomes more durable and acquires the character of property. Each proprietor has part of his lot in the different soil areas, so that the risks of cultivation are equalized as far as possible.[6] The rent or revenue is then distributed equally over plows or over cultivated areas. Some common pasture-land is usually left, and where part of this is cultivated, the produce, rent or revenue is divided among the cultivators

[6] Cf. Mukerjee: *Democracies of the East.*

equally. In irrigated villages the water is divided in equal shares. At this stage of evolution, waste lands, forests and irrigation channels are used and maintained for the benefit of a coparcenary community, which regulates the interest of each in these and determines the adjustment of village accounts. Meadows, forests, pastures, irrigation channels, do not pass through the stage of individual property, but on account of social necessities evolve from an absolutely free use directly to elaborate forms of regulation. Such has been the mode by which in the old settled tracts of the Indian river-valleys the village community has come to existence and by an innate vitality has survived empires and dynasties.

Communalism of Rice-Growing.—The necessity for collective regulation of water-supply in the case of rice cultivation is an important factor which has contributed to develop and perpetuate the economic and administrative organization of the village community in the monsoon land. In Japan and Java, as in India, rice cultivation has encouraged a good deal of fluid communalism and association of labor and maintained the compact village communities for the common interests of agriculture. Everywhere rice cultivation demands a system of irrigation which can make good the loss of water by evaporation, by leakage and by the continual passing on of some of the water to other plots belonging to other farmers, which encourages coöperative habits of work. Thus there are in Japan, as in Java and parts of India, hydraulic engineering works, as remarkable in their way as those of the Netherlands, which have been the work of unlettered peasants working in coöperation. Tunnels for conducting rice-field water through consider-

able hills, aqueducts, reservoirs, etc., which are met with in Japan and, indeed, throughout the Far East, represent a vast amount of communal labor hardly to be met with anywhere else. There are also numerous irrigation societies (*suiri-kumiai*) and associations for the readjustment of fields (*kochi-seiri-kumiai*), etc., which had their origin in very remote times. Floods were of frequent occurrence. Hence the construction of dams and dykes was undertaken coöperatively.[7]

Individualism of Wheat-Growing.—Anthropologists suggest that it is very probable that the rice-growing races of the South, among whom the institution of the communal holding of land with periodical redistribution of the field is inherent, took to Northern India the custom of communal ownership along with the *panchayat,* the appointment of which was the effect of the system of shifting tenures. Wheat and barley are associated with individualistic, as rice is with communalistic, organization of agricultural society. Wheat cultivation came first to Northern India with the Aryan stocks, with whom land was held as the family property. They did not live in contiguous huts like those of the Dravidians, but the whole family lived together in their own homestead. As both these principal crops have grown together, ideas of individual and communal proprietary rights have intermingled in the North, though there preponderates here the rule of individual (or family) property in land which distinguishes the *bhaichara* and *pattidari* systems of tenure.

Regional Demarcation of India.—On a map of India we may trace the following lines of demarcation:

[7] Ogata: *The Coöperative Movement in Japan.*

(1) Between facts of climate; e.g., areas of heavy and light rainfall. Bengal, Assam and Burma and the Malabar Coast of Bombay receive heavy rainfall and the chances of failure of crops in any years are remote here. Sind, Rajputana and the Panjab are areas of slight or nominal rainfall.

(2) Between facts of vegetation. The areas of slight rainfall just mentioned, as well as the desert parts of North-Western India, are regions of scanty grass and thorny shrubs. Evergreen forests occupy the belts of heavy rainfall, which comprise the West Coast of India, Burma and to some extent the sub-Himalayan tract. The deciduous forests extend from the foot of the Himalayas throughout the length and breadth of the Peninsula, and recur farther east in Burma wherever rainfall and soil are suitable to their growth. The soils of the Ganges and Indus plains support a characteristic vegetation, while the black cotton soil which occurs in the vast region of Deccan trap in the North-Western part of the peninsula grows corn, millet and cotton.

(3) Between the distribution of domesticated animals. There are distinct zones of the plow-yak (the Himalayan region), the camel (the Panjab, Central India, Rajputana), the ox (the grassy plains of Kathiawar, Sind, Gujrat, Malwa and Mysore produce the finest breeds of cattle), the water buffalo (the plains of Brahmaputra, the Sunderbunds and Malabar), the elephant (Assam and Burma).

(4) Between facts of irrigation. There are distinct zones of great reservoir dams (Central India and the Deccan), canal zones (the Panjab and the United Provinces), well zones (the Deccan, the Panjab and the United Provinces).

Geographical factors govern the distribution as well as the utilization of dams, canals and wells.

(5) Between facts of social organization. There are zones of village communities (the valleys of the Indus, the Ganges, the Cauvery), zones of large estates (Central Provinces, Oudh, Bengal), and zones of village estates (the Panjab and the United Provinces).

Agrarian Organization Largely Dependent on Region.—A casual survey shows that the tribal method of occupation, the feudal system, the manorial system, the ownership of land in fee simple and the village community, which are so many different economic bases of social relationship, are dependent to a considerable degree on the nature of the country within which each respectively has been formed. Feudal society rests on the system of feudal land tenure. The great farms of England and Scotland were conducive to the development of aristocratic government.[8] In the East, there were seldom large estates or a landlord class. In India and China the communal democracy of the rural commune and the occupational guild springs up on the basis of the small individual holdings and the handicrafts or small workshops. So enormous a population can hardly be supported, however, by so small a space. Hence, in the case of Chinese and Indians, there have been three alternatives: A lowering of the standard of living, more intensive farming or emigration. Incessant toil in hand cultivation maintains with difficulty the vast populations constantly receiving accession from the nomads of the North who have to quit their pastures owing to the gradual desiccation of Central Asia. If to these we add the early ma-

[8] Blackmar: *Outlines of Sociology*, chap. ii.

turity of women and the value of a large family in rice culture and domestic industries, we understand the cause of the high birth-rate of these regions as compared with Western Europe and America. Thus arises the insistent problem of Oriental emigration due to the vast surplus labor awaiting opportunity for winning a higher standard of living in other regions.

Regional Problems: White and Color; Tropical Luxuriance.—In the South where the tropical plantations exist, in Ceylon and Burma, on the flood plains of Indo-China and the Malay Archipelago, new problems of intercourse between white capital and yellow or black labor arise. These are connected with more general problems of white colonization and mastery in the warm lands. But the problems of race migration are as old as the ages. From the dawn of history, peoples have migrated from the rigorous climates of the North to the equatorial lowlands. The descent of the Aryans into India, the conquest of the Chinese by Mongols and Manchus, the recurrent barbarian invasions of Greece and Italy, the northward pressure of Kaffirs and Patagonians, the absorption of Asia and Africa into European colonies and spheres of influence, illustrate the Equator-ward drive from the less kindly climates.[9] On the other hand, the tropics are sometimes so overpowering that man succumbs to them. Vast areas within the tropics are beyond the pale of agriculture, or else can be cultivated only in a most haphazard way. The kind of intermittent agriculture which alone is possible in many jungle-covered parts of tropical lands is most demoralizing. Inasmuch as the people must change their fields every year, and in

[9] Ross: *Principles of Sociology*, p. 692.

some years may be unable to burn the brush which they have cut, they have no feeling of permanence. Thus the nomadic Fang who lives by gathering and cultivation, by fishing and hunting, in the Congo equatorial forest, has no idea of property. For him the soil belongs to no one, hence any one is free to establish himself on any unoccupied portion. His method of cultivation is primitive, without fertilizers or tillage, and he abandons the garden after the second or third crop. Thus, whilst the village moves on to the great forest, any rights that might have grown quickly lapse. In many parts of the tropical world there is no definite ownership of land, and even where this exists the owner has no encouragement to improve his holdings. It is useless to attempt to improve a tract which next year is to be abandoned once more to the jungle.[10] Much of the Malay Peninsula and Archipelago, for instance, is so fertile that the inhabitants have to do little more than clear the surface of the ground and plant cuttings to obtain crops. It is natural to find here in the interior a small negroid people, the Negritos, one of the most primitive races of the world. The rank tropical jungles of Borneo similarly have defied human labor and thwarted any attempt to develop definite rights of property, and they remain as uninhabited as the barren moss- and lichen-covered swamps of the arctic steppes.

Regional Studies a Corrective to Abstract Theory.—The above brief survey of the forms of property and their evolution in connection with natural conditions once again proves the need of introducing into economics the examination of the geographical environment, which will be

[10] Huntington.

found to be a corrective of abstract sociological theory. "Human Geography," writes Georges Gariel, "is destined to review all the sociological theories that speculate about some sort of abstract man." For example, the study of the different forms of ownership of water here examined does away with all *a priori* and absolute theories, both those that lay down as a dogma that individual property is the only form of property acceptable to human reason, and those that tend to a conception of state ownership as applicable to all the countries of the earth.

CHAPTER VIII

REGIONAL ECONOMICS

Coast-Lines, Their Features and Opportunities.—Economic life and relations in the village communities of India and China present striking contrasts with those on the banks of the great rivers near their mouths in the sea. In the level plains in the interior people tend to develop settled and conservative traditions. The peasant-folk on the Eastern Asiatic seaboard, on the other hand, are not stay-at-home, because of the call of the mighty rivers and the lure of gain in the contiguous islands. The most conspicuous feature of the Pacific coast is the series of island festoons which hang along the coast from Malaysia to Alaska, and which have promoted Eastern trade by the regularity of their arrangements. Thus from the main chain of Malaysia, the islands of Borneo, the Philippines and Formosa enclose the Chinese Sea and represent the sphere of influence of the Chinese merchant and laborer. The Chinese, indeed, have been some of the world's earliest navigators and maritime adventurers. The Kuro Suvo, a warm current comparable with the Gulf Stream of the American coast, which flows from south to north along the Eastern coast of Asia, helps to give a mild climate favorable to active industry and commerce throughout the year. The configuration of coast-line is another important factor in influencing economic development. The coast-line may be rich in bays and gulfs and estuaries forming excellent harbors and giving easy access to shipping, as in the case of

Europe and Japan; or it may be marked by an absence of such advantages, as in the case of Africa and the Indian Peninsula. In the former case trade and commerce flourish, in the latter case the greater part of the coast cannot be approached by shipping and hence commerce is impeded. All this has a marked effect on industrial advance. The islands of Japan are remarkable for the length of their coast-lines, which, compared with the area, give a ratio of one mile of coast to nine square miles of land. The flourishing fishing industries on the coast have served to rear a hardy race of seafaring folk. Add to these advantages her strategic situation with reference to the continent of Asia, and we will at once understand the cause and success of Japan's expansion. The sweep of the Japanese islands from Sakhalin to Formosa dominates the coast and ports of the continent. Command of coast ports involves command of railways and waterways leading to the interior, making possible the control of extensive interiors rich in economic resources. Partly by design, partly because of fortuitous circumstances, the railroads in which Japan has an interest give a pronounced strategic control of Pekin, cutting it off at both north and south. From the military point of view, the power to control ports and to seize railways makes it possible for Japan, in the event of war, to occupy all strategic parts of China with effective military forces within thirty days. Thus the appropriation of rights and interests by Japan in China, Manchuria, Mongolia and Siberia cannot be understood without reference to the above geographical features.[1]

[1] See Admiral Knight: "Japan's Foreign Policy in Siberia and China," *The Institute of Politics Lectures*, Williamstown, August, 1922.

Local Differences—Mountains and Rivers.—The surface forms of a country, its divisions into mountains and valleys, into high plains or plateaux and low plains, the distribution of land and water, the nature of the crops, must have, indeed, a marked effect on the social and economic development of a country. A mountainous country like Japan or a high plateau country like Tibet presents very different economic features from the well-watered plains of Northern India and China, the steppes of Central Asia or the warm swampy lands of the Malay Peninsula. A widespread network of rivers develops special features. The rich flood plains and deltas of the great rivers of Southern and Eastern Asia are among the most fertile regions of the world. The Indo-Gangetic plain, the Tigris-Euphrates region and the Nile valley have been seats of very ancient civilizations where the periodic flooding renewed the fertility of lands and man could grow the same crops on the same soil year after year.

Peoples of the Rivers.—But rivers give not merely fertility, they provide not only soil and manure, but also a highway for traffic. They develop the love of adventure and commerce. In the plains of Northern India the people are a gentle peasant folk, responsive to religion and education. In Eastern Bengal the mighty rivers introduce strong elements of movement and enterprise, of fishing and transport, in various ways stimulating, adventurous, even unsettling to, the peasant villages. The contrast, the mingling and the clashing of peasant and fisher population, so strongly formative throughout the history of Mediterranean and Western Europe, have long been here in evidence, though of course on the smaller scale of a river sys-

tem as compared with seas and coasts.[2] Peasant prosperity is advanced by easy transport and vigor and well-being improved by an ample fish diet. The villages are relieved also of their more restive young spirits by the call of the rivers, with their long perspectives and more adventurous careers. An adventurous stock in a riparian tract responds to the appeal of sport and luck which gives charm to the fisher life as well as to the stronger lure of gain, even comparative fortune through transport and commerce.[3] The extraordinary restlessness of the rivers, which frequently change their courses, wash away villages and bring to light new *churs*, attracting rival masters, has forcibly weaned the people from settled habits and from attachment to the solid forms of the everyday material world of the Northern Indians. Ownership is less tenaciously focussed on the forefather's plot, migration is more common, home less permanent, homespun prudence rarer and adventure and exploration more appealing. The mysterious and potent immensity of the rivers, the sweep of the storms and floods which devastate the land, have bred courage, hardihood, tenacity of purpose and a calm, subdued idealism which make the people one of the best specimens of sturdy, fearless and pious folk in the world. In a similar way, the rivers of China have built strange elements into the character of the sons of Han. In the gorges of the Yangtze there is the humble tracker, the human tug, who conquers rapids by the power of naked thigh. Through his heart-

[2] Cf. Le Bon: "The sea-shores give birth to special populations amongst which the dominant sentiments are respect for the family, a spirit of tradition mingled with love of novelty, and a desire for wandering similar to that of shepherds, but confined to the men."

[3] Geddes: *Life and Work of Sir J. C. Bose,* p. 3.

breaking toil at the woven bamboo cable, huge Szechuan junks are made to breast the flood and a million horse power of Himalaya's snows are triumphed over again and again by puny man. And when the river overflows, the breach in the dyke is repaired by building out from each side huge dams in the form of a series of mattresses of *kaliang*-stalks and sacks of clay each joined to the previous one by ropes and piles. The labor required for such purposes is so colossal and has to be concentrated in a number of places within such brief periods that the task can be performed only by China's millions.[4]

Delta Region.—Conditions are still more distinctive in the Bengal delta, which is an absolutely flat country intersected by a network of broad and deep rivers and countless streams. In some parts there is high land as a result of accumulation of silt. In others the land is still below the flood level and the rivers sweep over it, forming hollows and eating away old banks, so that the whole tract is formed and reformed like plastic mud, which it really is. There are also vast swamps, some permanent, while others dry up during the hot weather. Again, there are tiny islands which rise and disappear with scattered homesteads according to the course of winding streams. Gradually, the whole country rises in level. The long and narrow strips which border the rivers receive the greater portion of the silt and first emerge as dry ground, while the parts more remote are less silted and remain low ground still traversed by a series of rivers or *khals,* the water in which is generally affected by the height of the main stream.

Amphibian Life in the Delta.—Not very long ago, the

[4] Brunhes and C. Vallaux: *La Geographie de l'Histoire.*

dry ground between the marshes, rivers and creeks was covered with dense scrub or forest. Recently, however, the growth has been cleared by the cultivators and the marshes are being embanked; but during the rains, for eight months in the year, the country covering thousands of square miles is still a lake whose surface is broken here and there by a group of hamlets, and by the two narrow fringes of land which mark the course of the winding stream. Thus economic life centers for two-thirds of the year around these little isolated villages, each a tiny island in an ocean of water. Even where the rivers and creeks scour deeper and narrower channels and the dry ground is unbroken, the old watercourses become full of water during the rains, and there are marshes in the interior which hold water for a considerable portion of the year. By their sides villages grow up, more prosperous than the rest. The cultivator displaces the tiger and the crocodile, though he can work on the land, which yields a most luxuriant harvest, only for from four to six months in the year. His economic life is therefore governed by the break or discontinuity between the busy months of cultivation and the months devoted to fishing or trade, which all depends upon how long the water encumbers his fields. The grain of the delta is rice, which requires that the water stay on the land for some time, making a pond in which the plant grows. In the deltas of the Yangtze-kiang, the Ganges and the lesser rivers of India and Eastern Asia, the summer rain is often enough, without artificial watering, for the cultivation of rice. But in the low lands of the Bengal Delta subject to flooding, the characteristic crop is jute, which takes a great deal out of the soil and can be grown

only on lands renewed year after year by inundation silt. The common varieties of jute which are grown in the flooded areas stand in four or five feet of water in the latter stage of growth and the harvesters have to wade or dive accordingly. It is a sort of amphibious cultivation, boats sailing over what are really fields of jute and rice. Both these crops grow in varying depths of water, usually a few feet. But there are, as Ronaldshay observed in a village in the Dacca district, parts of the land where shallow depressions in the surface give the flood a greater depth—up to fifteen feet and more. The existence of these deeps is to be detected only by the particular variety of rice showing above the surface of the water. One would hardly expect to find crops growing in fifteen feet of water; nevertheless there they are, thick crops of a curious long-stemmed paddy which has so adapted itself to environment that on a rising flood it is capable of growing as much as a foot in twelve hours.[5] Such crops are reaped from boats, but ordinarily the man of Eastern Bengal spends the day waist-deep or more in water. In a world in which the cultivated land is under water for as much as five months in the year, and that at the time of growing, and in the case of jute, at the harvesting, of the chief crops, man necessarily becomes an amphi-

[5] So long as the rise of inundation does not exceed the rate of growth, the plants remain healthy. Actual stagnation of water is universally regarded as injurious. Yet it may be said that in many instances the rivers do not drain the rice fields, and that the removal of water is almost entirely a consequence of evaporation. The half-submerged islands, the creeks and estuaries of the great rivers, and the inland swamps are the characteristic areas of deep-flooded cultivation, where no manure is necessary other than the annual renovation through silt. A guess may be hazarded that as these conditions closely approximate those in the irrigated fields, the passage from simple agriculture to irrigation was rendered easy by observing such conditions.

bian.[6] Trade gradually prospers, but where the country knows scarcely any roads and where so many creeks and *khals* intercept passage by land at every step, boats not only take the place of carts for the carriage of goods but are also the only means of conveyance available for men. *Haturia* (bazar-going) boats, usually long-shaped, swift-going barks, are laden with the shopkeepers' wares, tobacco, salt, *gur,* vegetables and other articles. Behind this heap about a dozen men are seated, paddle in hand, striking the waters at full length front and behind as far as the hand can reach, communicating a motion to the boat which out-distances all ordinary ones. By dusk the wares are all sold, or the remnant is brought back and the party start on their homeward voyage. Generally they come with the tide and glide down at ebb, their journey being so timed. The surf may roll, and the nights may be pitch-dark, still the *hat*-going voyagers are not a bit afraid, for home must be reached. Nor is the importance of this trade negligible. The Bhairab from Kachha to Alaipoor, for instance, was the great thoroughfare through which the produce of Eastern Bengal formerly poured into Calcutta. At every flow and ebb of the tide a fleet of boats, the shape of the prow and stern of which easily suggest the district they come from, may be seen gliding up and down freighted with merchandise for the great emporium, and at the spots where they anchor to wait for the tide there is a busy scene and a floating bazar, where the villagers have come down with their vegetables for supplying the assembled crew, and where the fisherman also finds a readier sale for his articles at a

[6] Ronaldshay: *India: A Bird's-Eye View.*

higher price than he can obtain from the towns.[7] Trade and marketing, agriculture and land rights, industries and transport all bear the stamp of the Delta. The economics of these itinerant cities and villages on the intersecting *khals* and rivers is far different from the economics of the village communities in Northern India, even as the social habits and mental characteristics of the people are strikingly dissimilar.

Distribution of Resources.—A hardy, fecund stock in a country with abundant mineral resources, but with a comparatively small area, tends to develop contrasted ideas and interests. An inhospitable soil in the temperate regions originates scattered settlements, so that the social polity is of a somewhat different type from that in the fertile river valleys. People take to fishing and trade to supplement the scanty resources of their limited lands, and early become adventurous and individualistic. Thus they tend to develop a wide range of adaptability, an investigating, critical spirit which is the mother of discoveries and inventions, and a constant willingness to take risks and seek profit. The variety of local relief and associated phenomena and of forests and mineral resources makes their impress on social policy. The geographical advantages and the vast colonial and commercial acquisitions of England favored early the growth of commerce and industry based on steam and coal. Le Play was the first to discuss scientifically the social results of the advent of coal in England. The loss of family autonomy and parental control, the lack of

[7] Ram Shunker Sen: *Report on the Agricultural Statistics—District Jessore,* 1872-3.

education of children who have no real homes, and the power of the wine merchant and the grocer who serve as the only intermediaries between workmen who have been separated from their original places by coal, not only illustrate the social degeneration in mining centers but also characterize all urban agglomerations which are connected with coal. The rise of joint-stock companies and the loss of touch between shareholders and workers are also phases of exploitation. The herding together of masses of men in a few cities, their detachment from the home and the land, the divorce of interest and ownership in an industrial system which remains alien and incomprehensible to the mass of toilers, the decline of agriculture and of the village, are all connected with the rise of the great mine and the huge factory. The limitation and lack of variety of land resources directly encouraged industrial and commercial enterprise which, however, disturbed the normal balance between agriculture and manufacture. England in particular, which depended on her empire for food, neglected agriculture. Thus there have arisen contrasted types of rural exploitation which have been thus explained by Brunhes and Vallaux. Between these two types, the type of culture of the old civilization and the type of recent exploitation, the countries of Western Europe now represent a transitional type. They have not been able to realize to the same degree as the favored monsoon regions the types of exploitation which provide every one with all he needs. On the other hand, the geological complication and the geographical diversity of the divisions of the Continent will probably never allow Western Europe to reach to the unified and simplified exploitation to which the large and simple natural

divisions of North and South America are so well adapted. The patient and flexible strength of the human muscles which we call manual labor gives to the agricultural countries, such as China, India, and the Nile Delta, a considerable advantage over the countries of Western Europe. In these countries agricultural population is not so numerous, yet the cityward drift still continues. The balance between agriculture and manufactures could not have been maintained unless there were improved methods of transport, which enabled them to rely on the tropical and subtropical countries, or improved agricultural machinery, which saved manual labor. Here industrial life tends to be divorced from agricultural production and instead of the diffusion of population, capital and skill, we find unequal aggregations of population and wealth. If to the wealth which mineral resources give we add the commercial advantages with which countries in Western Europe are endowed, we shall understand how they maintain the equipment enabling them to acquire and rule dependencies in other parts of the world. Concentrative production, as well as rapid commercial development and colonial and imperial expansion, has formed the chief features of the capitalist industrial system. In India and China the direct touch with fertile land of large masses of population has been favorable to the development of arts and handicrafts in connection with agriculture and an organized village life. Here the conservative tradition of a heterogeneous but peaceful population perpetuates class, clan or caste differences, but these are softened by a strong local feeling, a living sympathy and closeness. In the absence of inducements to trade and colonization, due to the plenitude of natural resources,

there springs up a peaceful, non-exploitative economic organization on the basis of an equable diffusion of population and an interdependent system of rural and urban exchange which is in marked contrast with the individualistic capitalistic system of agriculture and industry in Western Europe.[8]

[8] For a fuller discussion of the regional factor in economics, vide Mukerjee: *Principles of Comparative Economics*, Vol. I.

CHAPTER IX

THE CORRESPONDENCE BETWEEN ECONOMIC AND SOCIAL TYPES

Human Instincts and their Modification.—Recent advances in psychology have a far-reaching significance for students of the evolution of primitive society. Social psychology, which is formulated as a basis for the social sciences, now insists that man's instincts must not be treated in the abstract nor in isolation. They are to be regarded as concrete sets of equipments which work out the adjustment of a people to a given environment. Nor may the bundle of instincts which underlie human behavior be considered as rigid and inelastic. Social evolution is accompanied by a change in the grouping of instinct-drives, and in the respective strength of those which govern the tone and direction of behavior. The discovery of new tools and implements, the importation of social customs and religious ideas from a neighboring tribe, a change in outlook due to contact with a strange people or a change of environment by means of continual migration may also bring about the domination of one set of instincts over others, upsetting or reinforcing, inhibiting or reintegrating for the time the established scheme of values. But the natural order or scheme of values of the region is bound to establish itself sooner or later, fitting in with the new conditions and acquiring a new unity and dynamic force from the cumulative influences of environment and social tradition. Thus the movement is constantly towards the isolation and indi-

viduation of instincts, on the one hand, and the formation of new groups of instincts on the other, so that the instincts expand and deepen into more and more universal values and extended relations of life. There is thus a spiral of social psychology having its under-reaches in the realm of the racial unconscious and ascending towards ever-widening, finer and more concrete conations. But no less significant is the phenomenon of dissociation of instincts and impulses. The disintegration of groups and values in the economic field may be brought about, for instance, as a result of migration and conquest which introduce a new economic method to which a people is not yet adjusted, or by the introduction of an industrial and social machinery which may not be adapted to the original equipment of instincts of a particular race or people. And the whole task of institutional renewal will lie in the reorientation of the established group-scheme and life-values.

Importance of Race Psychology to Social Science.—Thus comparative race psychology alone can furnish the key to social reconstruction. A regional and ethnic approach to sociology, utilizing the data of comparative anthropology, can alone supply the basis of new social experiments that will derive their strength from the concrete psychical endowments of diverse peoples and regions. Economics and sociology will, indeed, gain a new apparatus for handling social materials from a more particular knowledge of race psychology and the researches of anthropology and ethnology. Unfortunately, such studies, which stand between biology and civilization, have hitherto been more or less disregarded by the social sciences.

Movements and Meetings of Races.—Throughout the course of human history, there have been witnessed the processes of the conflict of civilizations and social types when two or more races have come in contact in the course of their expansion and the scale of instincts and social values of each has consequently been modified, assimilated or disintegrated. Much of the history of civilization has been influenced by the perpetual wandering of peoples in the course of their economic expansion—the confusion of races and stocks in their convection and radiation currents along land and sea. Such, for example, are the broad migrations from the cold continental land-mass to the tropics, from the tropics again to the temperate sea-fringes. Semple says: "From time immemorial the great deserts and steppes extending across the old world have borne and bred tribes of wandering herdsmen; they have sent out the invading hordes, who, in successive waves of conquest, have overwhelmed the neighboring river lowlands of Eurasia and Africa. They have given birth in turn to Scythians, Indo-Aryans, Avars, Huns, Saracens, Tartars and Turks, as well as to the Tuareg tribes of the Sahara, the Sudanese and Bantu folk of the African grasslands. But whether these various peoples have been Negroes, Hamites, Semites, Indo-Europeans or Mongolians, they have always been pastoral nomads. Again and again the productive valleys of the Hoang-ho, Ganges, Tigris and Euphrates, Nile, Volga, Dnieper and Danube have been brought into subjection by the imperious nomads of Arid Asia, just as the 'hoe-peoples' of the Niger and upper Nile have so often been conquered by the herdsmen of the African grasslands. Thus, regard-

less of race or epoch—Hyksos or Kafir—history tends to repeat itself in these rainless tracts, and involves the better watered districts along their borders, when the vast tribal movements extend into these peripheral lands."[1]

Race Development Associated with Change of Place.—There has been simultaneously a fundamental change in the balance of instincts and the scheme of socio-economic values from pastoral militaristic nomadism to settled peaceful agriculture passing on to trade and colonizing enterprise embracing the life history of all peoples from its early beginning in bleak table-lands to its maturity in the great plains and seaboards. It is unnecessary to show in detail the changes in character and capacity of races on their march of expansion, breaking over faunal boundaries that limit the distribution of other species and overflowing into other regions to which they were not originally adapted.

Man as Hunter.—But the broadly marked stages of economic development may here be reviewed socially and psychologically. The hopeless sterility of a region and the continuous decrease of game keep hunters constantly on the move to gather in their meager food supply. This restricts the social group to the small horde and makes the social organization simple and unstable. There is not much division of labor except that between the sexes, and the social group breaks up from time to time and scatters into smaller divisions as the result of food deficiency. Thus the hunter tends to be egoistic, a prey of passing sensations and desires. Decorse in an interesting study of hunting and agriculture in the Sudan observes: "If the hunter is rude and uncommunicative it is no doubt on ac-

[1] *The Influence of Geographic Environment*, chap. i.

count of the silence and solitude to which the chase has accustomed him—but it is above all because distrust and fear lurk in the forest and the thick bush. Life there is one continual tension of the senses; in front of him is always the mysterious and troublesome barrier of underwood; there is no horizon, nothing but dusk; the sharpest eye is deceived by fancies; man who is born to use his sight, has only his ear to depend on; less fortunate than the animals, whose nose replaces the eye, he is aware of his inferiority; he lives on the defensive, with watchful eye and straining ear." The struggle with forest and water and animals emphasizes instincts of self-assertion and pugnacity and the roving habit due to the search for food is associated with want of foresight, and alternating states of feast and fast, repletion and starvation exercising a deep influence on religion, custom and social relationships. For instance, the practice of devouring enormous quantities of food at a sitting and of fasting for weeks together causes alternation of abnormal nervous exhilaration with lassitude in which dream and suggestion, sympathetic magic and myth, dance and music, easily flourish.

Man as Shepherd.—Jenks remarks: "Absence of foresight is one of the most striking features of Primitive Man. But the occupations of the pastoralist are impossible without foresight; and the rewards which they bring to foresight are so palpable as to foster its growth. The choice of suitable pastures, the provision of water supply, the protection of calves and lambs from the tempest and the fierce beasts of the jungle, the careful mating of selected stocks, the long periods of meditation in the nightly watch over the flocks—all these must have tended to

bring out latent powers of the mind, and to elevate the character."[2]

The transition to the pastoral stage also has meant a more stable food supply and notions, more distinct than among wandering hunters, of territorial ownership, the right of communal use and the distinct obligation of common defense. Hence the social bond is drawn closer. The nomad identifies himself with a certain district, which belongs to his tribe by tradition or conquest, and has its clearly defined boundaries. Semple observes: "The transition to the pastoral stage has meant the substitution of an artificial for a natural basis of subsistence, and therewith a change which more than any other one thing has inaugurated the advance from savagery to civilization. From the standpoint of economics, the forward stride has consisted in the application of capital in the form of flocks and herds to the task of feeding the wandering horde; from the standpoint of alimentation, in the guarantee of a more reliable and generally more nutritious food supply which enables population to grow more steadily and rapidly; from the standpoint of geography, in the marked reduction in the *per capita* amount of land necessary to yield an adequate and staple food supply." The supply of milk relieved the woman of giving suck to the children and gave her leisure, while raw materials such as the hair or skin of animals encouraged her early tentatives towards art and craftsmanship which were further encouraged by the fact that the handiwork no longer needed to be carried on the back. In art and handicraft, wool and leather form almost the sole materials, while wood occupies a secondary place,

[2] Edward Jenks: *The State and the Nation*, p. 46.

and there is accordingly a great uniformity in the dominant types of art among pastoral nomads. There were greater opportunities of specialization. The men undertook the task of leading the herds to distant pastures and protecting them against wild beasts or their enemies. The children raised the young of the animals. The women worked the raw materials. But such specialization was limited by the deficiency of the pasturage. Lands were not boundless, while the presence of other pastoral tribes imposed limitations and brought about quarrels. The pastoral community could not develop a stable social organization, though it was capable of great expansion, while their transport contributed to their remarkable mobility. Pastoral and nomadic states are practically synonymous. Pastoral life requires wide spaces and agrees with the restless tendencies of the more forcible races. Cyclonic in their activities, they are not easily amenable to steady pursuits. It is well known that many of the pastoral folks show a strong aversion from field-work. And it is not before the area of their pasture-lands, and as a consequence the amount of their livestock seriously diminish as a result of encroachment of other pastoral folks or agricultural peoples that they accept the hard toil of agriculture. Before resorting to agriculture, the Ural Cossacks, who were surrounded by the Russian civilization, employed Russians to farm for them and farmed part of their land on the *métayer* system. Not only is there a sharp line of cleavage between the African pastoral tribes and the adjacent agricultural and industrial populations, but also the former arrogate to themselves the position of a superior people. Among some of the pastoral Bantus in particular, agriculture is done by a race of helots,

who till the soil and provide for their masters.[3] According to Lyde, a pastoral industry, with its paramount obligation to milk beasts at regular hours every day, year in, year out (and also to migrate regularly between summer and winter pastures), trains a different type from that trained by an agricultural calendar, where a rush of work at seed-time and harvest may be associated with long stretches of idleness between seasons. The former shows the predominant influences of herd standard and control organized and brought into play for the satisfaction of the tribal instincts of greed and mastery. A mode of life which is based upon more or less continual movement fosters a spirit of freedom and self-reliance which endows the pastorals with an aggressive character. It also develops a more systematic social control than either hunting, in which coördination of action is intermittent, or a sedentary pursuit like agriculture. This is further encouraged by their great mobility and habits of common warfare against wild beasts as well as by a relatively greater concentration of numbers in a small area. Among pastoral nomads a raid leads to complete loss of property, both for the rich and the poor, and thus in the same tribe there are peculiar traits of generosity, hospitality and democracy.[4] The roving spirit and enterprise not only resulted in the great racial migrations of the past, but, where exploited and utilized by chiefs of ability and ambition, found their expression in invasions and conquests. This was true especially of the mounted nomads, who achieved greater mobility and power of or-

[3] Buxton: *Primitive Labor*, p. 44.

[4] For the character of the Asiatics who dwelt in tents, cf. Huntington: *The Character of Races*, chap. viii.

ganization. Thus the mounted nomads have left their stamp on the racial and political history of both Asia and Europe. Nomads vary in their habits and social organization according to the difference of climatic conditions and the nature of the animal reared. Thus De Préville divides the cultural areas of the nomads in Africa according to whether there are cow-men or camel-men and so on.[5] Similarly, Hans contrasts the life of the pastoral peoples of Africa, based essentially on the raising of cattle, with that of the pastoral peoples of Asia, who own those powerful means of transport and locomotion, the ass, the horse and the camel. By the aid of the latter, the Asiatic nomads could extend their migration, develop warlike habits and become great invaders and conquerors. The African shepherds, being less mobile on account of their lack of transport animals for long travels, looked on their flocks in a miserly spirit, as treasures to be carefully guarded. They added to their pastoral activities a rudimentary agriculture—though they did not rise to the use of the plow—which rendered their type less pure and distinctive than that of the Asiatic shepherds.[6]

Man as Agriculturist.—Agriculture fosters and is fostered by the peaceful character of a settled population. It gives man a relative independence, and makes storing possible in cases of grains. It encourages combination on an irrigation scheme, or the building of a fence, dam or embankment. Establishing division of labor on a more stable basis in the family, it gives a start to the community and shows the way to greater social endeavors. It

[5] De Préville: *Les Sociétés Africaines.*
[6] Febvre: *A Geographical Introduction to History,* p. 268.

leads to a larger number of people living together in a relatively small area. It brings to the fore the constructive force of the gregarious instincts in coöperative behavior and encourages local and narrow interests in material needs and processes in which anticipation and toil, rather than chance and risk, play the more important part. It is here that the demarcation between industrial and non-industrial pursuits becomes stereotyped, though division of labor was carried to some extent in the pastoral stage. The skill required for the taming, breeding, guarding and exploiting of the flocks and herds, tended rapidly to a division of labor between the various members of the community; and the herdsman, the shepherd, the milker, the shearer and the weaver made their appearance, all acting under the authority of the patriarchal chief.[7] Economic differentiation also is encouraged by the peculiar conditions of animal husbandry. Thus the herds of one family are healthy and fruitful; they multiply enormously and increase the wealth, comfort and influence of the family. In another case a disease breaks out, kills numerous head of cattle and reduces a family to destitution and perhaps to slavery. Sometimes the shepherds come to own large herds, which they entrust to hirelings, and become half sedentary. Such are the Fulahs and the Tuculors of the Niger, described by Meniaud, who live in special communities generally united to a village of cultivators. Similarly, Gautier describes the nomad as the "financial aristocrat", lording it over the settled peoples, and in the Sahara compelling them to work for his benefit. Where men or women eke out a scant living from hoe-agriculture there is less room for inequality. With

[7] See Jenks, p. 47.

the advent of agriculture there was gradually established not only a division of field-work and other occupations as between men and women; the carpenter, the blacksmith and the irrigation-man were also differentiated, and in some regions the slave appeared. The improvement in comfort, security and social cohesion, and the adjustment between the interests of the community and those of the different functionaries in society, had profound effects on the development of character of a purely agricultural population. In every social relation there is striving after individual or specific interests, which are anticipated by the individual or group and controlled in the interests of general well-being.

Agriculture presupposes a relative security and mutual dependence, a certain amount of coöperation centered around a fixed settlement, all of which humanize and socialize the individual. Intermediate is the stage of nomadic agriculture in which people having semi-nomadic habits desert the cultivated land when crops are raised and retire into the backwoods. The continuous release of labor from the task of mere food-getting for higher activities, results especially in the rapid evolution of the home. Agriculture and the domestication of animals lead to more domestic and sedentary habits and bring about the ascendency of woman. The larger animals could only be looked after by man, hence a pastoral society showed the ascendency of the patriarchal family and the lower status of women. Pastoral tribes are usually organized upon a strict patriarchal and patrilineal basis. The head of the family is the absolute ruler and the owner of the stock and other possessions. He pays the bride-price, which takes the form of stock, and sometimes

obtains as many wives as he can purchase by the offer of cattle. It is not before agriculture is introduced—and it is the woman who invents agriculture—that she can improve her status. From the collection of wild grain growing among the grasses, of nuts, fruits and roots, to the planting of seeds is a very great step, but it is probable that this step was taken by accident by a primitive woman who found that seeds germinated when they were by chance left on a piece of land and who therefore lightened her labors by putting the seeds conveniently near her leaf-made cottage. This was the beginning of cultivation, which originally coexisted with hunting as an incidental form of labor in the hands of the women, while the men were hunters. The most striking feature of rudimentary agriculture is the ignorance of the use of domestic animals—notably of oxen. This is the agriculture which the Germans call "Hackbau" or hoe-culture. The hoe was originally made from deer horn or from a piece of a tree, hook-shaped, left on the branch where it is taken from the trunk, and hardened by fire; at a later date it was armed with metal and lastly made in two parts—an "iron" and a wooden handle.[8] The early hoe-culture carried on about the hut almost invariably rests with the woman. Indeed, the cultivation of crops reaches an advanced stage before the woman hands over the greater part of the operations to man. Thus man prepares the soil; woman sows. With the introduction of the plow, man, freed from his hard labor, takes up sowing also, and woman harvests. The more elaborate organization in the use of the land leads to economic differentiation of different localities, to the growth of social solidarity

[8] See Febvre: *A Geographical Introduction to History*, p. 287.

which is not limited to a single locality and to a rapid increase in the population supported by the material and human resources of a given region, so that the land becomes the dominant cohesive force in society.[9] Permanent agriculture has its great civilizing advantage, it encourages a deeper sociality, a stable form of government and social life, and the rise of private property.[10] Agriculture promotes the accumulation of capital and the growth of a leisured class as well as the development of industry and trade. Above all, agriculture emphasizes the principles of continuity and growth and human nurture. It gradually dispels that fear with its impulse to flee so manifest in races whom the hostility of the forces of nature would never allow to remain for many generations in the same spot. It inculcates habits of foresight, patience and wholesome labor, and breeds conservatism. It is the basis of the development of the family as an economic unit indissolubly tied to the soil.

Woman, Pioneer of the Agricultural Stage.—The presence of work at certain regular intervals in agriculture presupposes the collaboration of members of a family, joint sharers in food and estate, and then united in worship and enjoyment. The agricultural state is associated with thrift and prudence, a belief in a long scheme of things and a resignation to the overawing forces of Nature. This encourages personal cleanliness, and gives birth to a round of

[9] See Semple, p. 61.

[10] Elliot Smith observes: "The effect of the discovery of a means of securing a certain food supply capable of being stored . . . led for the first time in the world's history to a settled community. In the whole history of mankind no single factor has had an influence so great and so far reaching as the invention of the art of agriculture, which represents the beginning of real civilization."

fasts and festivals cyclical with the seasons. It checks the polygamous instincts, which became very marked among some pastoral folks living in the midst of roaming, multiplying flocks. With the stability of the family and a clear division of labor between the sexes, first marked in hunting and carried much further in agriculture, manipulative or constructive impulses received stress as a result of woman's more stationary condition of life.[11] While the men wandered farther afield as hunters or shepherds, or on the war-path, it was possible for the women, who had to wait beside the children, to make a real beginning of the home and in their leisure to dibble with pointed sticks, hoes or stone axes in the neighborhood of their huts, and also to work on stems and leaves and make huts or weave baskets and garments. The primitive cultivators of South America, Central Africa and the Indonesian Islands use mattock and hoe. According to Hahn, cultivation by the hoe is the first and most ancient form of labor on the earth, which produced for the inhabitants of the pile dwellings the millet, whose nutritive importance has long excelled that of all cultivated plants. In Central Africa the hoe is such an important tool that the iron head serves as money. Even in the densely-populated areas of China and India, the hoe remains the regular implement of cultivation used by the women in their gardens. The steady, hard labor of the primitive woman, the pre-agricultural woman in particular, has played no small part in the mental evolution of the race. The woman as the housewife and mother was the earliest cultivator, house-builder and weaver. She was also the earliest property-owner. It was she who first traced

[11] Cf. Thomas: *Sex and Society*, p. 143.

crude drawings on the floor, drew lines on clay and wood and was the soul of feasts and dances, which all contributed to the evolution of a higher social condition. Thus the instinct of workmanship, creative or inventive impulse, play, the instinct of acquisition, the parental instinct with its emotion of tenderness and its impulse to protect, etc., begin to exercise a more important rôle in mental and social life. Woman as the planter must have more foresight than the lowest savage, so as to await the ripening of seed and fruit. The burden of children attaches her to a particular place, or at least restricts her wanderings to a very limited area. Thus the same care and foresight which are necessary for the welfare of offspring and maintenance of home serve to protect the plants which furnish subsistence and thereby furnish the economic basis of more stable family control. Gradually acquisitive or possessive, artistic or inventive instincts are brought to the fore, and the irregularities of capacity and wealth are the occasion for a revised organization of social gradation and a corresponding change in the intricate balance of instincts.

Irregular Development.—The stages of economic development from hunting and pastoral to agricultural and manufacturing life have not been a straight and smooth advance, so that the contrasted social relations are obscured. Some peoples, for instance, have had no real pastoral period. The domestication of animals in others has been continued so long that it has kept alive the roving habit and the spell of nomadism to dangerous excesses. For instance, "nowhere in Africa do the fruits of the field form to the same extent as the herds the basis of life, the source of pleasure, the measure of wealth, the means of acquiring all

other desirable articles, especially women; lastly, even currency, as when *pecus* gave its name to '*pecunia.*' Even when the stage of culture is well advanced these cattle-farming people suffer from the narrow basis in which their livelihood rests." The herd is the only available wealth and there is no attempt to make profit. For money is of no use, while the herd feeds itself and multiplies. But animal raising depends ultimately upon the pasturage. Thus the herds cannot improve because of the absence of agriculture. On the other hand, the progress of agriculture and its invasion of the open grasslands as the result of an increasing population, or simply of a higher economic value, diminishes the contrast between the shepherd and the husbandman. Again, the contrast between the different economic types is mitigated because regional conditions themselves encourage transitional types. Thus there are shepherds who are half agriculturists, while there are peasants who are half-nomadic. The phrase "nomadic cultivation" itself refers to a reality which is apt to be ignored in a rigid, schematic view of social development. In India, the Santals have become cultivators of plants but have not been able to give up their roving habit. They tend cattle, goats, pigs and fowl and also till the soil. After harvesting, they rove in the woods. This also is the case of many wandering tribes in Assam and the Chittagong Hill tracts, and in North America. Even where they are more settled, they must change their habitations from time to time, because their agricultural methods lead to soil exhaustion. The Mikirs of the Assam range practise the form of cultivation by axe, fire and hoe known as *jhum* and raise a few small animals they meet by the way. Their villages are nomadic, moving

from place to place as the soil in the neighborhood becomes exhausted. The Lushais similarly practise *jhum* and constantly move from one site to another, and in this fact is found a reason for some at least of their peculiar social characteristics. Thus, each village is a separate state ruled by its own chief and with its boundaries undefined. The sons as they reach majority are each provided with a wife and followers and sent forth to the hills where the *jhums* are to be made and new villages founded. The aboriginal tribes of the Malay Peninsula are similarly still nomads to some extent, existing largely by hunting, fishing and the produce of their search for fruits and roots of the jungle. But most of them practise a primitive agriculture, sowing in a rude way small patches of rice or millet; their method of cultivating their half-wild orchard trees, which grow as well in the jungle as elsewhere, is limited to throwing away in certain patches of the jungle the seeds or stones of the fruit they have taken. From the gathering of grass seeds, wild rice and millet and the raising of a few small animals there was no doubt a gradual progress, which we cannot trace at present, to the planting of cereals with the help of cattle and plow, but the progress was the result of an inevitable accommodation to the vicissitudes of man's environment.

Primitive Woman Rule: Polyandry: Polygyny.—The economic development of peoples has been irregular, according to the characteristics of particular regions. The different economic phases or states merge into one another when compelled by necessity, or some states are passed over due to a change of environment; and, indeed, the different conditions under which human society exists imply that

we should not adhere to the categories of the three stages rigidly. Again, in the same society we often have different ways of living, theoretically separate. Hunters and fishermen naturally like to follow their occupations alone, and in forests and on great rivers their lives, like those of their prey, must be nomadic. But sometimes the women, being less nomadic than the men, supplement the results of the chase with those of primitive agriculture. This occurs particularly in tropical regions where the heat and moisture will give the maximum result from the minimum effort, e.g., the planting of a banana or manioc shoot, and where the crops ripen all the year round. While man looks after the game, or consumes roots, leaves, fruits, honey, etc., woman, whose body and mind are occupied with a more indirect and prolonged system of production, advances much beyond him.[12] This involved a new type of domestic control where the men were at a discount, and this had its reactions on different phases of family life and relations. Wherever the conditions of life are easy and families can exist without the husband's help, the woman is the unit of the family and the relations are stable. According to Westermarck, it is an economic condition which, in the lowest communities, determines the duration of marriage and possibly also the line of descent, through mothers or through fathers, with its reactions on all social relations and methods of social control. Where the work of hunting and cultivating animals, left entirely to men, is the sole source of family livelihood, women are at a discount; and in some regions, where the stress is acute, polyandry is practised and the surplus of women kept down by infanticide. The

[12] Cf. Bucher: *Industrial Evolution.*

Hopi of Arizona, who are essentially agriculturists, are matripotestal. The matrons control the property of the tribe, even going so far as to claim the women captured by the men in war. Among their neighbors the Navahos, who were formerly hunters and are now sheep-breeders, although kinship still follows the mother, the control of affairs is in the hands of the men.[13] Rivers points out that among the Todas and in the Marquesas Islands, and possibly elsewhere, polyandry is associated with female infanticide and it has been supposed that polyandry is a result of the scarcity of women so produced. It also has been supposed that polyandry has been the result of inequality in the proportion of sexes, due to the scarcity of food supply, this producing either a small proportion of female birth owing to physiological causes or leading to the practice of infanticide. It is noteworthy that the only definite example of polyandry recorded in Africa should occur among a pastoral people where culture possesses several features closely resembling that of the Todas.[14] Polyandry checks the increase of population and keeps the family property together when the husbands are brothers, as among the Tibetans. The life of the mounted nomads involved constant warfare and along with the capture of herds women also were the booty. Thus, a prosperous pastoral folk rich in animals adopted polygyny and left the drudgery of agriculture to women and to slaves, male or female. This meant a more regular and stable economic life, but it also meant the subjection of women. Polygyny is common in many parts of the world, especially among the

[13] Buxton: *Primitive Labor*, pp. 205-7.
[14] Article on "Marriage" in *Encyclopedia of Religion and Ethics*.

well-to-do. But it is not confined to the wealthy. It is in Africa, where the conditions of life tend to be luxurious, that polygyny is seen at its height, and it is more frequent among pastoral people and the higher agriculturists than among the hunters and the incipient agriculturists. It is also significant that pastoral societies often seclude their women. The societies from which Islam sprang were pastoral nomads, not agriculturists.[15] Agriculture tends to bring the sexes into closer relationship with one another.[16] Corn-planting and corn-gathering, and then such arts as basket-making, pottery and weaving, first developed under the ægis of woman, and long maintained by her until man established himself in stable relation to land, not only reacted upon woman's physical frame, nerve and brain, but also directly upon social life and values by recovering for her a fraction of her lost status and independence.

Woman's Status Dependent on Her Importance to Agriculture.—Even after the introduction of agriculture, the men cleared the forest, leaving the cultivation solely to the women, or they helped women in ploughing and harvesting, but not in the minute care of the crops or the arduous task of preparing the soil. Gradually the woman ceases to work in the fields, and thus the social position of a woman is always betrayed by her hand. Where agriculture is the only source of family subsistence and is the lot of the woman, the customs attendant on exogamy and the tracing of descent through mothers tend to place restrictions upon the power of the husband, while vesting it in the woman's male relatives. Thus in Africa, among the Bantu races, matrilineal

[15] Westermarck: *The History of Human Marriage.*
[16] Lowie: *Primitive Society.*

descent usually prevails, though even here the authority of the husband and father is paramount except in certain matters, in which traces of the authority of the wife's kin remain. Fallaize thus traces the change in relative economic value of the sexes: "The economic value of the woman, as an important factor in the production of material comforts and utilities, as a source of the accession of strength from outside, and as the mother of future members of the tribe, was recognized at an early stage; and this accounts largely for the fact that many of the functions of the family of which the father was recognized as the head in a later development were vested in those related to the woman by blood—at first the kin as a whole, later the smaller group within the kin consisting of her immediate male relatives, or, using family in a looser sense, the family connected by blood ties. It is only by gradual stages—through the bride-price, the compensation, whether it be the husband's service for his life or a term of years, the exchange of another woman (a sister) for the bride, the loss of all or some of his children, or a payment in goods or money, or through forcible abduction—that the husband has been able gradually to secure independence of the unit of which he becomes the head, in location, in the disposal of property, and in ordering of lives of its members." In Africa, amongst the majority of the Bantu peoples, agriculture is left to the woman. In most of the primitive tribes and castes in India, agriculture falls to the woman's lot. Amongst the agricultural castes, custom settles the respective shares of the men and women in field-work, and this is adapted to local conditions and resources. In most parts of the world, if the man has another occupation, he leaves

a large portion of the agricultural work to the woman. In the more advanced parts of Western Europe it is only the rapid development of agricultural machinery in the last fifty years that has gradually banished women from field-work. But the agricultural duties of primitive woman also brought her important rights. Her labor gave her a right to the soil which, as the importance of agriculture became more marked, brought her many other privileges in its train, and these privileges had the greatest influence upon the history of family relations.[17]

Importance of the Object of Cultivation.—But agriculture influences not merely domestic organization and the system of family control. Like the differences in climate and food, the nature of the plant which is the subject of the first economic experiment has far-reaching effects. It is well-known how the material called *tapa* from the bark of the paper mulberry is connected with the rich endowment of artistic and inventive instincts of the Polynesians. In India the Terai and other tracts in the North which slope from the hills send down to the plains not only the torrents but also annual streams of migration to the plains when the crops are cut, and the social contrasts between the hillmen and the plainsmen of the Indo-Gangetic communities are obvious. The gradual conquest of ginger, pepper and turmeric by rice is a step in the civilization of the Terai Doms and Chamars, who form the bulk of the lower castes in the hills and whose slow assimilation into the plainsman type is an interesting phenomenon in the sociology of the United Provinces. The relations of coconut cultivation to

[17] See Grosse, quoted in article on "Agriculture" in *Encyclopedia of Religion and Ethics.*

the social economy of peoples in the islands of the Indian and the Pacific Ocean are also significant. In the Coral Isles of the South Seas, the coconut is the most precious gift, and where it does not grow there are no inhabitants. Wealth and rank are gauged by coconut trees. The land is cut up into very small plots, but the title to the trees does not pass with the land. It is a separate transaction: one may buy a piece of land, but cannot use the nuts. In times of drought the natives are not permitted to make copra, since the nuts are needed for their own food and for seed. Another interesting tree is the pandanus, which is almost as valuable as the coconut and constantly associated with the social economy of the people. Edible grasses, which are free gifts of the desert, maize, rice, wheat and coconut have all played an important part in the development of the art of agriculture and their socio-physical effects on the people are unmistakable.

Social Reactions of Rice- and Wheat-Growing.—Rice demands many laborers and minute care from them; it requires no highly perfected agricultural tools; it demands little manure but much water; it can flourish only by arduous hand labor and by irrigation of the flat basins of land under coöperative management. The rice fields must be watered and drained at fixed periods under careful supervision and equitable collective discipline. Rice, as has been observed, thus encourages communal instincts and habits due to this collectivism for the utilization of water. The cultivation of wheat, on the contrary, is individualistic. Wheat cultivation thrives with the investment of a large agricultural capital, the use of farm machinery and a close approximation to factory methods and regulation; thus the

great fields in Canada may be said to be populated by machines rather than by men. Wheat cultivation is associated with hay-growing and thus with pastoral industries. In newly-developed and scantily populated regions, wheat-growing and cattle-breeding on a large scale are supplementary to each other. Cattle are raised not for milk but for meat, which is exported to the old countries. The capitalistic organization, which is the characteristic sign of what is called "commerce agriculture", into which wheat agriculture easily evolves, only arises among people who carry on cattle breeding. The success of wheat cultivation denotes an advanced and elaborate agricultural-industrial stage. Rice, among many natural races, on the contrary, is not cultivated at all, but collected in great quanties after the rains. Again, in the superior agricultural stage, the raising of lowland rice plants in small sprouting-beds and their transplantation, as well as most of the other work in connection with terrace-grown rice, can be done only by hand, and by careful individual attention distributed over relatively brief agricultural seasons; thus the place of machinery and even of beasts of burden is limited. It is a striking instance of the social effects of cultivation that the substitution of dry crops such as millet, maize and potatoes for rice has helped in the break-up of the matriarchal household organization among the Khasis of Assam. In the case of the wet paddy lands at the bottom of valleys, several matriarchal households coöperate in digging the skilfully-contrived channels, often two to three miles in length, and building dams. But where the dry crops are grown, there is a tendency to the disintegration of the communal households, and potato cultivation in particular has emphasized this feature. Thus

we find more joint matriarchal estates in the Jaintia Hills where rice is usually cultivated and the potato very rarely. Further, while wheat develops into capitalistic large-scale farming and the leasehold system, rice cultivation is compatible with an equality of rights amongst peasant proprietors. The cool, moist winter and the dry summer so essential for the success of the wheat crop, and the wet summer and humid air without which rice cannot grow, represent contrasted weather influences, in so far as the former stimulate nervous and muscular functioning, while the latter depress them. Wheat is richest in proteid, while rice is the poorest. The lean Yankee develops a katabolic type, while the thickset Chinese exhibits an anabolic type. There are also other significant contrasts in the machinery and methods of wheat and of rice-growing which enable us to appreciate some—though by no means all—of the socio-psychological differences between what we may briefly denote as rice and wheat zones. Even in the richest wheat zones of the world, like the Red River valley of the United States and the black-earth districts of Southern Russia, the one-crop system of wheat cultivation leads to a steadily increasing exhaustion of the soil.

Accompaniments of Soil Exhaustion.—In old countries in Western Europe this has been accompanied not only by an enormous increase of land values, creation of large estates, and a consequent widening of the gulf between the economic classes, but also by the development of non-agricultural pursuits like the raising of horses, the keeping of cattle or the making of butter, and the introduction of farm machinery, postponing the inevitable decline of yield under the operation of the Law of Diminishing Returns; and, in

the new countries, this waste of soil resources by the one-crop system has led to the atavism of nomadic habits in the backwood clearings and forest settlements, keeping civilization always on the move towards fresh fields and pastures new.

Agricultural Methods and Population.—Indeed, the crowding of the population into cities, and the enormous cheapening of transport rates, led during the nineteenth century to the adoption in new countries, particularly in North America, of what is perhaps the most wasteful method of farming known—continuous and extensive arable cultivation without periodic spells of leguminous and grass crops. The result has been a rate of expansion unparalleled in older countries, and wholly beyond the farmer's power to remedy; consequently he left the land and moved on.[18] On the other hand, the congregation of more than half the human race in South-East Asia has been possible only because of the achievements of intensive agriculture and the rotation of leguminous and other crops which are the chief features of rice-growing. It is interesting to note in this connection that *rahar,* ground-nut or pulse crops, which are usually rotated with rice for renovating the land, balance the excessive starch consumption from rice in the Indian dietary.

Rice cultivation is accordingly compatible with a great density of population and a high birth-rate which do not permit meat diet and animal raising characteristic of the relatively sparsely peopled wheat regions. In contrast to China and Japan, North America and the South Temperate Zone are relatively unoccupied lands. There are at present

[18] Russell: *Soil Conditions and Plant Growth,* p. 152.

two standards for the utilization of land: the South-East Asiatic standard of rice cultivation, hand labor, largely non-flesh diet; and the Western standard based upon wheat cultivation, work animals, agricultural machinery and industries. The former develops anabolic traits which affect the permanent tendencies of the race and contribute a great deal to certain racial characteristics, manifesting themselves in the capacity for prolonged toil, thrift, ability to live on little, phlegm and land inertia. These afford opportunities for vegetable gardening and handicrafts which require great labor, and for an intense local life in rural communes and gilds. Thus the contrast between rice and wheat growing is significant not merely in agriculture, but also in sociology, in ways very often ignored. Indeed, the primeval hand labor garden crop, which is Asia's great gift to the world, is the mainstay not merely of the endurance and homespun prudence of her teeming millions, but also of the peaceful settled habits of her abiding, communalistic civilization.

CHAPTER X

THE EFFECT OF ECONOMIC ON POLITICAL RELATIONS

Modes of Life and Their Associated Politics.—The above survey of the contrasted social relations between agricultural and sedentary and pastoral and commercial peoples has prepared the way for an economic interpretation of politics. There is a perpetual discord between races, in different stages of social economic development, which exhibit different types of human behavior. "To the Chinese, a restless nomad life, full of privations, was inconceivable and despicable; the nomad looked with contempt at the life of his agricultural neighbor, with all its cares and toils, and esteemed his own savage freedom the greatest happiness on earth. This is the actual source of the distribution in character between the races, the laborious Chinese, who from time immemorial have attained to a comparatively high and very peculiar civilization, always avoided war, and looked on it as the greatest misfortune; while, on the other hand, the active and savage inhabitants of the Mongolian desert, hardened against all physical consequences, were ever ready for raiding. If he failed he lost but little, while in the event of success he secured the wealth accumulated by the labor of several generations."[1] The contrast between the martial and peaceful type of behavior will be seen to possess a new significance when we realize the diversity of plain,

[1] Ratzel: *History of Mankind*, Vol. I.

steppe or mountain politics. For instance, the virile and expansive political power of the peoples of the great plains or river valleys is in sharp contrast with the warlike ability and capacity for rapid conquest and political consolidation of the nomads. Febvre observes: "A warlike spirit, a sense of discipline, the supreme authority of the tribal chief —such are the essential characteristics of nomad societies; and they are sufficient to give to them a considerable relative strength and the best possible power of action against settled peoples. And so when they are not compelled by the insufficiency of natural resources to divide themselves into minute communities—as in the case in the region of Lob Nor, or in the Kirghiz country—the nomads succeed easily enough in establishing great empires. That of the Arabs and that of the Fulahs are good and typical examples —but these empires are ephemeral. The nomad conquerors keep themselves distinct from the conquered; at the most, they assimilate a few of the characteristics and typical elements of the civilization of the latter: but they make no attempt to improve upon it. The only well-known example of improvement introduced by a people of nomad origin into a conquered land is furnished by the Arab agriculture in Spain." Intensive agriculture in the fertile valleys inhabited by a dense population disciplines it in peaceful cooperative habits and develops an intensified local life, creativeness and decentralization in politics on the basis of social peace and concord between races and classes. Thus there is always a correspondence between the social, economic and political stages and relations and the type of behavior agreeable to each. For the same reason the antagonism between peoples in different stages of development

is fundamental. Professor Ross observes: "Rarely can hunters combine with herdsmen or herdsmen with agriculturists. Their manners of life and economic interests no more blend than oil and water. The endless strife between Bedouins and sedentary Arabs, between prairie Indians and forest Indians, between Scottish Highlanders and Lowlanders, is proverbial. The cattle-raising Hottentots of South Africa are never on good terms with their neighbors, the hunting Bushmen, although they are one in blood and land." Similarly, races subject to the same geographical influences are made ready to enter into social relations with one another and to be welded into characteristic social types when circumstances are favorable. Thus in South-Western Asia races of most various origins have all been assimilated over an immense area and show a certain degree of similarity of human character and even greater similarity in language. A certain mode of life is forced upon the Indian tribes of the prairies which subsisted by the chase of the buffalo. The Eskimos of the arctic tundras are brought into one plane of practice by the dictate of their common geographical environment. The Asiatic nomads are stamped so deeply by the steppe which they wander over that from time to time leaders have arisen among them who have united them in attacking the adjacent settled peoples. Such leaders were Attila, Ghenghiz Khan, Kublai Khan and Tamerlane.[2] The successive waves of Central Asian nomads pressed westward to Europe and the Mediterranean, though as a rule they were checked when they reached the relatively narrow region between the Mediterranean and the Baltic Seas. These great incursions are

[2] Ross: *Principles of Sociology*, p. 82.

not really to be attributed to drought but to the overcrowding of men and cattle in their own locality. Drought is a constant factor and never ceases to play its part in Central Asia. Its effect is increasing, as the gradual drying up of Asia has been usually considered an established and undisputed fact.[3] However, the great overflow of Central Asiatics into Western Asia and into Eastern Europe, always towards the West, has ceased. Now, Eastern Europe is characterized by its uniformity of structure and relief, with great belts of similar climatic conditions and similar natural vegetation extending through it into Asia, giving opportunity both to the movement of military forces and also to the much slower migration of tribes and peoples, mainly in an east-and-west direction. The early civilization of the Mediterranean region had an economic basis which would be impossible with the long and severe winters and the poor water supply of Eastern Europe, and the repeated incursions of Asiatic nomads across the southern and warmer portion of the Eastern Plains prevented the development of this region. From the human, as from the physical point of view, this area was an extension of Asia for many centuries, and had but a scanty population. In the successive incursions of the Asiatic people, we may see merely the natural spread of nomads seeking to occupy more and more of their natural habitat—the natural grasslands; and it may be mentioned that the Westward movement was not stopped until the extreme limit of the grassland was reached in the plain of the middle Danube. In the Central belt, the force of the invaders was spent: here they found conditions of life alien to their traditions, and

[3] Huntington: *The Character of Races*, chap. iii.

when the tribes of the Asiatic grasslands succeeded in conquering the forest-dwellers of Central Europe, they had either to adopt the mode of life of the people they subjugated or to live parasitically upon them. For example, the Bulgars adopted the husbandry of the Southern Slavs, and later some of the Turks did likewise, while others extorted from them the means of livelihood in the guise of rents and taxes, or by more obvious forms of pillage. The grasslands of the plain of Hungary formed an exception to the rule; here the Magyars were long able to remain a pastoral people although no longer nomadic, yet even they extended their power over neighboring districts where conditions demanded a different economic system. Further away in the forested Chitral belt, forest-dwellers from Asia were more easily able to keep their traditional methods; moreover, there were few inhabitants in the new country, so that the Finns and Ests should be regarded as settlers rather than conquerors. These Northern peoples are obviously Asiatic in appearance and characteristics, but further south the "race" or "stock" of the conquerors became greatly modified, and in most cases their physical characteristics are now almost indistinguishable from those of the "European" people. Nevertheless, the traditions and names of the invading tribes have been preserved, differences of language remain, and very frequently feelings of hostility and memories of conquest separate them from their neighbors.[4] Another instance of the exploitation of the peasantry carried on through a system of land tenure is offered by the checkered history of the Baltic

[4] J. F. Unstead: "The Belt of Political Change in Europe," *Scottish Geographical Magazine*, July, 1913, p. 187.

Provinces, Poland and Lithuania, under the overlordship of the Prussian, Russian, Polish and Lithuanian barons; and here also, as in Eastern Europe, the outstanding social and political question is the land question.

Economical and Political Modification through Migration and Conquest.—Biological principles, in so far as they relate to the nature, variety and permanence of psycho-social types and the laws of hereditary succession, lie at the root of both politics and economics. The topographical conditions through which races have pursued their onward march of economic progress from the nomadic and pastoral to the agricultural and commercial stages have also left their stamp on the differences that evolved in race temperament with its correlated differences in socio-economic types, conservative or progressive, communal or individualistic, agricultural or commercial, peaceful or aggressive, etc. It is now recognized by anthropologists that stocks born and bred in the grasslands of West Central Asia influenced largely the physical characteristics of the races of Europe. The economic historians now consider their influence on the economic method and organization. Both the domestic animals and the older staple crop plants appear to have come to the Western world with them. Thus there was a change in the technology and culture of Europe, and not merely in its social composition as mentioned above. The patriarchal type of institutions, including the tribal and gentile organizations, is thus introduced, and, indeed, there is considered to be rough concomitance between the distribution of these cultural elements presumably derived from Asia, on the one hand, and the distribution past or present of the brachycephalic brunette type on the other.

The dolicho-blonde culture of the Scandinavian region, on the other hand, was less profoundly affected by the Aryan invasion than that of any other equally well-known section of Europe. On its introduction into Western Europe the nomadic, pastoral scheme of life was greatly modified. It seemed to have formed into a system of mixed farming in Europe, which combined tillage with a sedentary or quasi-sedentary grazing industry. According to Veblen, such particularly appears to have been the case in the seaboard region of the North, where there is no evidence that tillage has been displaced by a nomadic grazing industry. Indeed, the small-scale and broken topography of this European region has never admitted a large-scale cattle industry, such as has prevailed on the wide Asiatic ranges. An exception, at least one partial and circumscribed, may perhaps be found in the large plains of the extreme South-East and in the Danube valley; and it appears also that grazing, after the sedentary fashion, took precedence of tillage in prehistoric Ireland as well as here and there in the hilly countries of Southern and Central Europe. Demolins, one of the most brilliant workers of the school of Le Play which has made a special study of the influence of physical environment in determining occupations and domestic and social organizations, and in molding indirectly through these the mental qualities of peoples, shows how the communal system and the isolated and independent patriarchal family organization of the pastoral nomads are displayed more clearly still by the population of Southern Russia, who, of all the settled European peoples descended from such pastoral nomads, have suffered fewest disturbing influences; how still the individual is subordinated to the

community, to the *mir,* by which all private life and industrial activity is directed and which is the owner of the principal property, viz., the land. The Celts arriving in Gaul retained these qualities and something of the patriarchal organization, although they were no longer simply pastoral nomads; for in the course of their migrations they had been forced to take up agriculture and the raising of other domestic animals, especially the pig, through lack of open steppe land. The Nordic peoples subsequently superimposed upon the patriarchal communal régime a loose military organization of clans, with their dual ownership of the soil and the system of personal loyalty and protection. According to Demolins, the characteristic features of the patriarchal organization and the clan system which subsequently prevailed for many generations have governed the deep-seated mental traits of the French nation (summed up by Buckle in the phrase "the spirit of protection"), which throughout their history have played so large a part in shaping the destinies of the people, and which are still a source of grave anxiety to many patriotic Frenchmen. On the other hand, the physical peculiarities of Scandinavia—the mass of barren mountains at the feet of which are small, isolated strips of cultivable soil which can maintain a small population only, early developed the form of an individualistic family (as distinguished from a patriarchal community) and perpetuated its chief features together with the spirit of enterprise and voluntary combination undiminished to the present day. Everywhere the Northmen went they conquered, and either exterminated or drove out the indigenous population, as in the South and East of England, or established themselves as an

aristocracy, a ruling military caste, as the Franks and the Normans in Gaul. And everywhere they established firmly their individualistic social organization, especially the isolated homestead of the individualistic family, characterized by the despotic power of the father and by great regard for individual property and for the rights of the individual as against all institutions and public powers. In hostile countries the homestead became a fortified place, or at least was furnished with a fortified keep or castle; and in those regions, such as Gaul, in which the indigenous population was not exterminated, the feudal system must thus have been initiated.[5] Whether in the plains of the Weser and the Elbe or in the British Isles, in the newly-opened territories of Canada and the United States or in the homesteads and settlements of the colonies and dependencies in Asia and Africa, we find the same spirit of independence, enterprise and initiative which has characterized all the widely-separated branches of one racial stock and of this alone. In the dim past the pioneers of civilization were the patriarchal communities nurtured in the wide Asiatic ranges and plains whose conquest of the world was rendered easier by their mastery of the uses of iron. Thus the technology of Europe underwent a radical change and this reflected itself in the new growth of domestic and civil institutions in the new situation. In recent centuries civilization is carried forward by stocks who had been nurtured in the long prehistoric ages around the coasts of the Baltic and the North Sea, especially in Scandinavia, or by its widely ramified and separated branches, through the cumu-

[5] Demolins: *Histoire de la Formation Particulariste,* Paris. The above summary is from McDougall: *The Group Mind.*

lative effect of new environments and processes of severe selection, such as the migration from the North to Central Europe, that from Central Europe to England and that from England to America and the colonies and dependencies.

Conquering Races from Temperate Climes.—Thus there has been progressing a converse process in the history of civilization. The conquerors of the world are no longer the Aryans, but different branches and sub-branches of peoples in Europe whose geographical barriers have stood in the way of that indiscriminate racial intermixture which has gone on for centuries in Asia, for instance, and whose broken coast-line, indented by fiords and bordered by islands, as well as warmed by the Gulf Stream, has bred a race of hardy seafarers who at the same time practise agriculture, and whose recent discovery of the possibilities of steam-power opened for them the gates of the world for mastery and exploitation. New elements of technological equipment are introduced by the Euro-American peoples into Asia and Africa, altering the whole scheme of ways and means and shifting the pursuit of a livelihood to new lines. It is characteristic also that the new institutions are carried on with a high hand by a new intrusive population that overruns the world and imposes its own cultural scheme upon the Asiatic and African peoples along with the introduction of new material factors. It is well known that slavery as a system was developed in warm or hot lands under the domination of people from temperate regions and we still hear of forced, penal, decoyed or indentured labor in tropical mines, plantations and jungles. Tropical climate also carries with it danger to the health

of immigrants from temperate lands. Thus white industrialism has made more rapid advance in those portions of the tropical or subtropical world which lie near the sea or are mountainous. Here the white man can settle and take a direct part in agriculture, mining and such manufacturing enterprises as production of sugar, cottonseed, oil and the like, and Western institutions easily find their prototype here. But, in the case of those lands where the white population cannot thrive by labor, black or yellow population is decoyed or invited to produce high-grade raw materials such as rubber, cotton, jute, hemp, tea, coffee, tobacco, timber, etc., and the resident whites become the dominant landowning class.

Interracial Economics in the Tropics.—The development of agriculture everywhere is based on multiple crops. In the one-crop system of agriculture, as in the tropical plantations, we find a close approximation to factory methods and regulation along with the rise of slums and sweated labor, even in the midst of a sparse pastoral or agricultural population. The one-crop system in Africa and Asia, indeed, has been a fruitful cause of agricultural depression, and agricultural crises and famines show the dangers of commercial exploitation. Indeed, the acute problems of interracial economics connected with the exploitation of the tropical and subtropical regions arise from the disturbance of the normal equilibrium between agriculture, manufacture and commerce, with its reactions on political and social life. Accordingly, the social type is governed in part by the system of exchange that is established between the village and the city and the different levels of the valley section. Thus, the socio-economic phenomena

associated with an interdependent system of rural and urban economy, or with commercial parasitism and urban profiteering, have their reactive effects on the basis of social and political relations. Much light on the differentiation of social types will be thrown by such comparisons, e.g. the relation of intensive to extensive agriculture, the relation of both to the value of land, the time relation of agriculture—backward to nomad occupations and urban industries, the one-crop and the multiple-crop system, the relations between rural and urban economy, the relation of economic to political independence; and in all these it is evident that not merely climatic but also ethnic, social or political factors are at work. All these characteristics of economic life and organization give rise to different methods of distribution of wealth, social esteem and social differentiation. Different social traditions and values evolve, and all these working together and in interrelation with economic institutions alter and modify the social type and the physiognomy of a particular culture.

Civilization as Adaptation to Environment.—From our standpoint, the history of civilization, fundamentally considered, is the evolution of man's customary responses to the changing conditions of his natural and social environment. Social customs and institutions may be regarded as social tropisms and reflexes due to external stimuli, which have survived as a result of selection in adapting the inherited instincts and other internal organic factors of the people to the geographic environment. But social history is very irregular and complex. The commingling of different ethnical elements which result from conquest, expansion and consolidation of tribes and folks into peoples

and cultures brings about social and demotic amalgamation, and introduces new life-schemes, values and judgments. The whole system is reviewed afresh and perhaps new values are now made the basis of the hierarchy of power, authority and service in the social constitution. There is at this time introduced a mental plasticity which raises customary codes to positive and plastic ideals, consciously realized by society, and much that is of local or ethnic significance is shorn off. In the case, however, of non-migratory races which have been adapted, by selective processes of centuries, to their physical environment, and which represent very large volumes of settled population, their customs and traditions can be but little modified by driblets of immigration. It is among these stay-at-home rural peoples that we find the best examples of the adjustment of the arts of life through the effects of physical factors and through formation of habits and social instincts which are correlated to the physical factors, comparable to features of animal ecology and behavior.

Irregularities in Social Development.—But even in the normal course, the diversification of ways and means of gratifying desires, the evolution of the arts of production, change the established balance of the system of instincts and scheme of values. These have their effects on the social stratification and the distribution of wealth and authority. Perhaps they influence the birth- and death-rates of different layers of the population and speed up social changes and upheavals or usher in new ideals of wealth, toleration and culture. When manufacturing enterprise begins to play an important rôle in the development of society, the

urban population is differentiated from the rural, and this differentiation is sharpened also by ethnic factors. This upsets the normal division of social functions between the city and the village, and modifies the social type. From the statistics of the three predominant races of modern Europe, Closson has shown that in the countries inhabited jointly by these three races, the race possessing the smallest portion of wealth and the smallest representation among the more influential and educated classes constitutes also the least migratory element of the population, and tends in the least degree to concentrate in the cities and more fertile regions of the country; whilst the race possessing the largest portion of wealth and the largest representation among the more influential and educated classes is also the most migratory element of the population, and tends in the greatest degree to concentrate in the cities and the more fertile portions of the country.[6] Urban concentration leads to moral and physiological degeneration. Economic development is thus bound to be irregular, the movement and spatial reaccommodation of the progressive races starting reactions against themselves. Apart from this, the manifold racial effects of industrial developments are in many respects unwholesome. To prevent the waste of the national material a forward agricultural policy therefore has been placed in the forefront of national programs in many countries. A sound agricultural population with a high birth-rate is regarded as a necessary condition of life for a nation that does not wish to degenerate. The conviction gains ground that an independent peasant class

[6] C. C. Closson: "The Hierarchy of European Races," *American Journal of Sociology*, Vol. III, p. 315.

makes the groundwork, the backbone of a nation. This class since the last war, indeed, is helped and cherished as much as possible. The depopulation of the countryside has, therefore, called for social and ameliorative measures and the spread of industrialism in the villages is viewed with alarm.[7] Thus manufacturing production is to-day counteracted by spatial reaccommodation. The economic development and the resultant geographical distribution of peoples have been, thus, far from regular. A new social and spatial adjustment is to-day witnessed in the less advanced agricultural regions of the world as a result of the political dominance and industrial enterprise of the people of temperate regions, or a higher economic value, or under the pressure of an increasing population. In the steppes also, nomadism is altered and restricted by the establishment of a régime of peace and security and the opening of wider and easier outlets for their special products or the incessant advance of colonization of new peoples. There is a new relationship of man to land in the colonies and dependencies of the European powers due to the spread of industrialism, in a stabilized Sahara where dry farming is progressing or in the central plateaux of Asia where the Mongols are gradually being absorbed into the sphere of influence of the sedentary Chinese, and new markets for their animals and products opened in China and Siberia. Thus the open grasslands, or fields or factories in particular geographical conditions, and the economic system with which they are associated are undergoing transformation. Here the change in social type is due to modification not

[7] Landburg: "The Danger of Degeneracy," *The Eugenics Review*, April, 1922.

in the geographical but in the social and political factors. A given type of society is possible only under the conjuncture of all the natural and human factors of existence. Thus social evolution, like biological evolution, is not only diversely ramifying but also discontinuous.

CHAPTER XI

THE SOCIAL REACTIONS OF CONQUEST

Interferences with National Development.—The uniformity of economic development and of evolution of social values is checked also by the imposition of an exotic social organization or cultural system by the conquering force of a vigorous, warlike stock. Such political factors often determine the feudal or the communal stage of landholding and its effects on the whole scheme of private and public relations are far-reaching. Ross gives some interesting illustrations: "The Jew's distaste for farming is seen to be a traditional attitude caused by confinement in the Ghetto for several centuries and debarment from owning farm-land. The proverbial thriftlessness of the Irish peasant is traceable to centuries of alien landlordism and rack-renting. Again, such national peculiarities of the Japanese as self-immolation in battle, ritual suicide and exaggerated politeness are products of the severe feudal compression from which they have only recently escaped." There are large estates in China owned by retired officials and their families and leased to small farmers; but the majority of farmers still own their individual small holdings and are mainly congregated in village communities similar to those of India and Russia. The ownership, too, is similar to the arrangements found in the Indian and Russian village communities in that an individual's holding may consist of several plots or portions of plots scat-

tered all over this cultivated area. The only difference is that we do not find the land in numerous narrow strips, this difference being accounted for probably by the almost standard measurement of Chinese fields.[1] But, the more fertile the soil is, the smaller the farmers and the more minute the subdivisions.

Peasant Proprietors of China and India.—The village organization of China and India is not governed by conquest and subjugation but is mainly that of peaceful aggregation and expansion of families, clans and tribes, each enjoying patriarchal self-government constituted by the elders, every one of whom must be a paterfamilias. Both China and India are lands not of large estates, but of peasant proprietors, who often form groups of relatives which bear little relationship to other groups. Strangers or outsiders are not given rights and privileges unless they have lived in the villages for some time. It is true that in China the distinction between the literati or gentry and the common people, and in India that between the non-cultivating Rajputs, Jats, Gujars, etc., and the peasantry, as well as the rise of capitalistic and financial interests, have modified the socio-economic organization by introducing the landholding aristocracy, but the countries have remained on the whole bulwarks of communal landholding and peasant proprietorship.

European Political Phenomena and Landholding.—Throughout the greater portion of Central and Eastern Europe, the autonomous type of political organization has met the imperial or subjugating type. In Western Europe the seas and gulfs and the highlands and uplands together

[1] Mabel Ping-Hua Lee: *The Economic History of China*, p. 25.

form barriers separating the relatively small productive areas sufficiently to give them distinctness and individuality. Here, therefore, were seen the growth of nationalism and the development of democratic government. Eastern Europe, on the other hand, is characterized by uniformity, even more marked as regards its people than as regards its physical conditions. Moreover, Eastern Europe was subjected to repeated inroads from Asia. Thus this region became the seat of three great empires, comprehending a diversity of race, language, religion and nationality in which Asiatic influences are significant. This has left its impress on the type of landholding. In ancient Northern Europe the environment of the forest tribes stands out clearly as having powerfully influenced their tribal, rural communalism. But often the feudal order prevailed over the village community and the rights of individual households. Thus, in Western Europe in the Middle Ages the landlord became the owner of common lands, and so abused his judicial powers over tenants that the villein became servile in more or less degree. In France the wars increased the misery of the French peasantry and there occurred the great peasant rising. In the sixteenth and seventeenth centuries, the peasantry gained the protection of the crown against the landlords, while absenteeism was also advantageous to peasant independence. Peasant proprietorship existed in France in the pre-revolutionary days, but it was the Revolution which freed the peasantry from the remnants of feudal and manorial subjection. In Great Britain the power of the landlord was especially emphasized after the Black Death, when they enclosed the com-

mon lands and monopolized stock-keeping. The land systems of Sweden and Russia are alike in that in both regions the large manorial estate has persisted as the unit of rural economy. In East Germany the Germans were a conquering and colonizing race. There were large estates which were the result of eviction and consolidation of land in the junker's hands. In Western Germany the peasantry could hold their own, though the vineyards and some other estates were held by large proprietors. In the Mediterranean region the compact land settlement and capitalistic farming were an outcome of the surface relief and topography, the inhospitable soil and the difficulties of agriculture due to climate. In the South of Europe—Spain, South Italy and Sicily—the system is based mostly on large-scale landholding. The rural workers here congregate into large villages and work on the *latifundia* whose early history is a story of war, devastation and disorder, of privileged migrant shepherds and of malaria. The economic policy of favoring pastoral farming encouraged the formation of large grazing properties in England, Spain and Italy. In Spain the expulsion of the Moors and Moriscos created great voids filled by extensive pasture-lands. In Sicily the large estates cover about one third of the productive area. The owners frequently are absentees who make over their estates to lessees, and it is the lessee who makes labor contracts of various types with the laborer. The estates, including both grass and arable land, are worked under primitive conditions of husbandry. In parts of Andalusia there are large estates given over to special crops, such as olives and other fruits, and employing large numbers of

day laborers. But often they are not cultivated or are under-cultivated.[2] In Eastern Europe it was the political dominance of the three empires, accompanied by the seizure of lands, which governed the land distribution. Russian nobles in the Baltic regions, Poles in Poland, Magyars in Hungary, Austrians in Bohemia and Turks in the Balkans held considerable territories and reduced many of the native people to the state of laborers or serfs. Moreover, those who had maintained or gained the status of peasant proprietors held their land on a tenure which commonly was onerous or precarious. In Hungary, Poland and Russia, serfdom was abolished about the middle of the nineteenth century, and the consequence was that large landowners had to make new arrangements for obtaining labor to work their land. The question was whether the possession of some land of their own would enable the ex-serfs to hold out against the desire of the large landowners to employ them as laborers and would compel those landowners to let their land rather than work it themselves. In Russia and Poland the peasants own for the most part, and more and more land was let or sold to them by the large landowners, who, after a struggle, found this the most convenient way of disposing of their land. These results were secured in advance of the wholesale dispossession of Russian landowners at the time of the Revolution. In Roumania, on the other hand, the process did not take place until after 1919, when millions of hectares were apportioned among the landless peasants under legislative action.

[2] Vide Irvine: *The Making of Rural Europe;* and Conacher: "The Regulation of Agricultural Labor Conditions in Continental Europe," *International Labor Review,* August, 1923.

In Hungary, the large landowners had consolidated their position. Large estates have become inalienable by a process of family settlements under trust, often with primogeniture, such as the State sanctions with certain limits under the Magyar laws of succession. But in all these countries land hunger became as characteristic of the peoples of this belt as of the peoples of the Russian plain, and was one of the most important factors in the break-up of the empires.[3] Immediately after the political and military dominance was removed, the dispossession of the landlords was accomplished. The new forms of land tenure are small estates, and the main question is the extent to which the ownership of the small holdings is to be individualistic or socialistic.

Manchu Land Policy in China.—Let us review briefly as a contrast the story of expropriation of lands by the conquering Manchus in China. It is true that when the Manchus established themselves in Pekin, they granted lands confiscated from the imperial family, the Satrafs and the high officials of the dethroned dynasty to their kinsmen and followers, as the Normans did in England. But such grants as a rule were very small in comparison with those held by the feudal lords in Europe. In the second place, during the Tsing dynasty the title of nobility was inherited in a descending degree until it reached the thirteenth, in which last degree the heir would practically become merged in the body of the community. Thirdly, instead of granting large tracts of land to a few lords and letting them subdivide to the lesser lords, as was done in feudal times in

[3] Unstead: "The Belt of Political Change in Europe," *Scottish Geographical Magazine,* July 16, 1913, p. 189.

Europe, the land was granted directly, whether the grantee was prince of the blood of the first degree or a common Manchu soldier. Gradually the greater parts of the lands thus held under military tenure came to be held under the common tenure. The Manchu government deliberately promoted the extension of the area of cultivation by giving lands free to the cultivators, granting subsidies in the way of seed, oven and farming implements to encourage the people to reclaim waste lands. Theoretically, "all the land under heaven is the property of the Sovereign; all the dwellers on the land are the sub-subjects of the king." But in practice the right of ownership of the Emperor to land was more nominal than real. Hau Liang Huang observes: "Lands once held by private individuals can be dealt in freely. They can be sold, mortgaged or leased without interference on the part of the government; and the terms employed in the transfer of lands are similar to those used in the transfer of ordinary personal property. The only condition of land holding in China is the payment of an annual tax and a registration fee in case of transfer. The right of taxation is based on the theory of government rather than on a partial ownership of land; we may say, therefore, that private ownership of land under this tenure is as nearly absolute as it can be under any government in the civilized world." In a densely-populated country it was inevitable that the imperial policy towards land would be to parcel out the alluvial area among the cultivators as far as possible. Thus the government had never held any extensive public domain excepting educational lands or lands endowed to temples and tombs of the sages, etc. Large land holding was always looked upon with dis-

favor by the government. Landless peasants were aided in every way to acquire possession of the land. As the result of the persistent application of this policy, there is in China a minute division of landholding such as perhaps will not be found anywhere else in the world.[4] Generally speaking, the peaceful development of peasant farming and the high standard of voluntary social coöperation which the village community has evolved in China and India are in striking contrast with the European states whose violent and kaleidoscopic changes exhibit the process of superimposition of conquering kings or overlords, and an accompanying and dependent process of expropriation of the peasantry. In China and India, the original expanding group took with it in its migration the craft of agriculture, and this accounts for the great development of population. The lower types of culture were thus assimilated and uplifted, and given a definite place in the social system, which exhibited a process not of superposition of groups as in the West, but of fusion and segregation of groups within definite communities.

Class and Group: Disabilities of Class-Ruled Society.— Apart from the contrasted types of social behavior which the different types of landholding involve in societies exhibiting such differences in the historic process, we have to trace the effects of the presence or absence of the class system on the splitting up or unity of the social mind. It is thus evident that, in ethnology and social psychology, the most elementary and fundamental facts in group origin and evolution have to be analyzed for an investigation of standard behavior. The class has tremendous effects not

[4] Vide Hau Liang Huang: *The Land Tax in China.*

only on the behavior of the inferior but also on that of the superior. The communal group, on the other hand, which is rooted in accretion, fusion or assimilation, is associated with a definite type of mind. There thus arise distinctive types of social and economic organizations corresponding to distinctive political attitudes and vice versa. These differences in types, indeed, look back to the migration, conquest and ethnical subordination of people in the long past. They are connected with the forcible superposition or peaceful acquiescence of races and sub-races and the corresponding attitude of the ruling state, dynasty or dominant class. The whole tone and temper of a society formed by war and conquest are governed by disabilities along several lines which these relations give rise to:—

(1) The introduction of slavery, (2) the introduction of a social class on an ethnic basis, (3) the social subordination of women to men, (4) the supremacy of the warrior class defended by a certain socio-ethical code (bushido, chivalry, feudalism, etc.) and (5) the creation of a landed class, or aristocracy, by the expropriation of the conquered peasantry.[5] Thus Achille Loria conceived of all history in terms of an economic struggle for control of land, and of social evolution as involving successive stages of slavery, serfdom, and payment of rent, leading to an ultimate freedom of the soil by means of peasant proprietorship.[6]

Society Based on Group Coöperation.—On the other hand, in agricultural communities such as those of the East, which have been formed by the dominant influence of

[5] Ward: *Pure Sociology*, p. 205.

[6] Vide Loria: *Economic Foundations of Society;* and Pound: *Interpretations of Legal History.*

gradual assimilation and absorption on the basis of the tribe and clan, groups based on kinship or neighborhood (common land and water, etc.), voluntary organization assumes endless varieties of form and function and the rights of each are guaranteed by custom and tradition arising out of the voluntary coöperation of diverse social bodies. The State is not indissolubly bound with the organization of the classes, but is subject to the laws and conventions of clans and gilds which no class or state can override. Oppenheimer has clearly shown that the tendency of the development of the State and the tendency of the evolution of economics lead towards one point; but both he and Ludwig Gumplowicz regard as eternally inseparable form and content, government and class exploitation. From our point of view, the Class State is not an imminent, but only an historical category, though it has appeared among different communities and in widely different regions. There is no doubt that among peaceful settled agriculturists of the great plains of the East, the contrast between the master and the slave class has not emerged, excepting when an alien ruling class has established its dominion and expropriated the peasantry. Thus in Japan the hierarchy of classes, the *daimio,* the *samurai* and the peasantry, shows the development of the feudal state. Not less significant are the instances of Mongol, Pathan and Mogul conquests and states in Persia, Central Asia, China and India, which showed markedly distinct stages of the subjection of a peasant-folk by a tribe of herdsmen, desert and prairie-born lords, having energy, endurance and desire and capacity to rule. But the general course of evolution has been towards peaceful integration and assimilation of hos-

tile elements as well as ethnic amalgamation; while the large estate, the first creation and the last stronghold of the political means, has not been a striking feature of the social system as it is in the West. Even when feudal nobility, farmers of revenue or state officials were superimposed upon peasant proprietors, which is the general rule, the rights of the peasant proprietors, clans and communities were fairly secure from usurpation. Thus neither the Japanese feudal lords nor the Manchu nobles, neither the Muhammadan *jagirdars* nor the Mahratta or Sikh lords, could abrogate the right of the individual cultivator or ignore the corporate rights of the village community.

Western Landlordism and the Peasantry.—In the West, as in the East, the village commons belonged to the folk, and in accordance with an original custom, probably universal, the village assembly disposed of it. But this right of disposition passed in Western political evolution to the territorial magnate with the remaining royal privileges, and thus the peasantry, split apart by class and by economic contrasts, was handed over without power of resistance to the magnate or landlord. Economic historians point out that it is the creation of the class of landless proletariat and their migration to cities—the necessary consequences of the rise of vast landed estates—which in turn are the causes of the present system of distribution of wealth; and this régime has reflected itself in the formation as well as in the internal policy of the states in the West. The mask of the large estate has preserved it from undergoing the fate of all other feudal creations. Yet "this last remnant of the right of war" is an obstacle in the pathway of

humanity, and doubtless economic development is on its way to destroy it.[7]

How "State" Evolves into "Society."—Much light is thrown from this direction on the difference of the concepts "state" and "society." The content of the "state" is the economic exploitation of one class by another through political means, while "society" denotes a harmonious adjustment of social groups in a régime of free citizenship. Thus the Hegelian ideal of the state process as the development from slavery to freedom is in reality the conversion of the "state" of the present into the self-governing "society" of the future. The constant revolution and struggle in a state which integrates itself by conquest engender an atmosphere of fear and conflict which have their reactions on law and the system of agrarian distribution as well as on civic and private relations. But out of this friction there emerges a self-reliant and progressive people which gradually wrests from unwilling kings and nobles both legal and economic freedom, and ultimately establishes control over the entire social constitution, which remains flexible and adaptable.

States: Individualistic-Liberal and Communalistic-Conservative.—In the contrasted type, rights are guaranteed to people organized in village and communal bodies and assemblies and the strong fabric of customary law protects a fair amount of liberty of thought and action within the legitimate spheres of their particular jurisdictions. Thus are sown early the seeds of conservatism and complacence in an essentially agricultural people and rigidity and group-coercion in the social system. Comparative social psy-

[7] Oppenheimer: *The State.*

chology thus finds two broadly marked types of racial temperament:

(1) The individualistic-liberal, of which the lever of social reconstruction is either the initiative of the individual or the general will of the State, which superimposes upon the body politic the notions or standards of the dominant class of the day. However, that dominant class is never the peasants, but the landlords, and, since the Industrial Revolution, the capitalists or the industrial laborers. Further, the interest of the dominant class governs social policy in the name of an individualism which is born in the struggle with land and sea. The categorical imperative of the State has its foundation here in the hypostasis of the Individual, both the State and the Individual being regarded as abstract entities. The perpetual antithesis between the Individual and the State which feeds the ire of revolution is due to the fact that in nature and purpose one is not reducible to the other.

(2) The communalistic-conservative, of which the lever of social reconstruction is the tradition of voluntary cooperation of various village and communal assemblies acting through what is something more than the will of the majority, i.e., unanimity or consensus. Such groups arise freely and spontaneously among new races and ethnic stocks gradually and peacefully assimilated and oriented within the social type. There is hardly any superimposition. A land distribution prevents the development of distinct and powerful classes, such as peasants, landlords, employing farmers and paid agricultural laborers. The economic solidarity maintains a high degree of social cohesiveness. Here civilization is not of urban manufacture

but of the whole country's making, and is inspired by the elemental ethics of the fields: the arts and the ruling and ritual of life come from the myriads of village communities, which are independent centers of public opinion in village councils, guildhalls and temple gatherings. The web of history here is a parti-colored garment, not woven after one color and pattern in a few towns, but variegated by the intermixture of threads of all colors contributed from everywhere in the country. The vitality and creativeness of village life and organization in this social type integrates the individual with the community through a multiplicity of group-wills, which are as concrete and real as individual purposes, and consequently resolve any possible conflict between the Individual and the State.

The spirit of the community in both types is progressive, but the elements and methods of progress are different. In the former type society achieves first the unity of the State and the legal organization of relations, and then orients the economic and ethical relationships. In the latter, Society from its very start builds its legal and ethical life on elementary economic and personal interests, and then attempts to mold group life and organization according to a code of ethics which it seeks to apply to all persons and groups. There is thus no one key to the philosophy of history as there is no one criterion of racial type and evolution.

CHAPTER XII

THE ECONOMIC RELATIONS BETWEEN ADVANCED AND BACKWARD REGIONS

Tropical Plantation System and Its Inhumanities.—The methods of capitalistic production have brought about an enormous disparity of wealth and opportunities between the directive classes and the masses. The class distinction between the *entrepreneurs* and the wage-earning proletariat, and the corresponding distinction between agrarian aristocracy and the landless laborers brought about by the agricultural changes which new industrial conditions initiate in old countries, are reproduced vividly with the coming of modern industry into tropical and subtropical lands. In the tropical plantations, the need of organizing labor for the production of only one kind of crop in large quantities is largely responsible for debt-bondage, contract and forced labor, which are often more inhuman than the old system of domestic slavery. Ross states: "Negro slavery would never have gotten such a hold on the South had not Europe stood ready to absorb cotton in unlimited quantities and pay for it with manufactured goods, which slave labor is so unfitted to produce." Another early example is in sugar-growing in the West Indies, Brazil and elsewhere, which was largely responsible for African slavery. This applies more or less to all industrial crops in the tropical and subtropical regions, which have kept alive contract, indentured or forced labor in various guises.

Labor is also demoralized by the herding of masses of men, recruited from the countryside, into the plantation centers, which either keep apart the sexes, by employing men only or women only, or else permit their indiscriminate intercourse owing to the neglect of housing in such centers. Not merely are the surrounding agriculture and stock-raising ignored, but there is also a progressive exhaustion of the soil owing to continuous cultivation of a single crop. This accounts for the abandonment of many Brazilian coffee plantations, for instance, while the Malaysian rubber plantations already are feeling this danger. Native agriculture, weaving, pottery, iron-smelting, etc., throughout tropical Africa and Asia have been threatened by the trade with Europe and America. The specialized production of a few staples, and those usually incapable of being transformed into a local food supply, results in virtual slavery to the dominant state, with its social and political consequences.[1] Among the more backward races, the tribal administration is destroyed, village communities disintegrated and men forced to work in mine or plantation under the lash or allowed in default to starve. Their lands and cattle are expropriated, their women dishonored and their most elementary rights denied. Add to these the demoralization caused by the production of crude intoxicants by planters or their unrestricted import and sale by traders, and we obtain the picture of black and brown men of distant tropical lands toiling as the slaves of their masters in the temperate countries. As the plantation system concentrates itself on one crop, so it concentrates also on one kind of labor, either male or female. Usually there is

[1] See Keller: *Colonization*, chap. i.

a striking excess of males over females, resulting in forced celibacy and all the evils associated with it. Thus the family life and tribal solidarity are dissolved. The use of force and fraud in the recruitment of labor and the insanitary conditions of its employment check the supply of labor, even as bad husbandry lowers the yield. Where the native remains intractable, alien labor is imported, the population becomes heterogeneous and there is cleavage along lines of race, caste and economic power. In tropical plantations, the exhaustion of soil is accompanied by the proletarization and desocialization of the people, there being no social groups but only masters and slaves. Huge plantations, large-scale production, slavery and extensive miscegenation cause a social cleavage at the outset, while the scattering of ethnic groups, native and mongrel, in what might be termed manors as distinguished from village communities, leads to the break-up of the tribe. In many parts of the tropics, the outrages committed upon the natives, the decimation of tribes by raiding, brutality, alcohol, forced labor, the raping of their women and so forth, have greatly reduced the available labor supply, or caused the natives to retire into the more remote forests. Thus the intensive exploitation gives the same result when applied to human resources as when applied to natural resources.

One-Crop Agriculture Uneconomic.—Agriculture must be saved from the application of the methods of manufacturing industry, which seeks to standardize growth processes in husbandry, natural and human.[2] The remedy lies

[2] Vidal de la Blache observed that "the modern European is an indefatigable laborer at a task which tends to render uniform, if not the whole

in varied production as contrasted with single crops. A recent writer states: "It is noteworthy that events in some tropical lands have laid bare the unwisdom of monocultural methods. In Brazil the universal policy of devoting too much attention to coffee or other single product is giving way, and the government is encouraging a more varied production. Another example is in the success attending negro peasant proprietorship in the West Indies and a varied cultivation to replace the lost sugar trade. The fostering of the self-supplying native locality and small community need not interfere with the legitimate cultivation of those products so largely required for foreign export. At present native independence is looked at askance or even discouraged, because the white master fears the depletion of his labor supply. The adjustment of these conditions is a matter for a science of human geography and industry-planning."

Tropical Economy, True and False.—Thus regional development of arts and handicrafts and varied production of all products and all articles necessary for life will give back the independence which has been lost. Tropical economy represents quite a different valuation of goods or labor with the native, whose life and labor must not be allowed to be governed by the conditions of distant markets. Overproduction, dependence for revenue upon a single article, and demand for only one kind of labor, which are all subject to the fluctuating prices of foreign markets, are bound to be accompanied by economic crises, and black

planet, at least each of the zones of the planet." If the equatorial forest escapes this exploitation to a great extent, it is no doubt, amongst other reasons, because the great variety of its products is a source of perpetual trouble which deters him. (Raveneau.)

or brown men starve or thrive according to the fortune of the promoter or concessionaire, with his company of absentee capitalists. This feature of tropical life represents so unstable an equilibrium of world economy that it cannot last long.

Some Principles of Economic Regionalism.—The principles of economic regionalism which emerge from the above evolutionary outlook may be enumerated thus:

(a) The occupation or folk must be considered in relation to the plane of the region. As economic and social adaptation chalks out the region's natural orbit, forestry, pasturage, agriculture and manufacture must be made supplemental and complementary to one another in different parts of a given region. Economic equilibrium can be attained only if folks and occupations in different levels of the valley section work harmoniously together for the uplift of the entire region. The supremacy of one or other of the succeeding stages or types of socio-economic life and organization is bound to react unfavorably upon the progressive development of the region. In sectional industry-planning lies the practical application of economic ecology. Folk art and folk literature, folk music, drama and recreations similarly must be preserved from the "bleaching process." The rural mind, simple in its devotion and faith, intimate with nature, alive to the growth processes around it, and creative and sympathetic like these, must be preserved from the invasion of city standards. Education and religion, above all, must be rescued from the psychology of the city.

(b) Where resources of organized community life are

lacking in the region, a good deal may be accomplished by a rational mode of coöperative organization, as seen in the movements of school consolidation and church federation, agricultural coöperation and coöperative production and use of electric and other power in the countryside.

(c) Our knowledge of laws of heredity and breeding and production of new varieties of plants and animals enables us to change profoundly the aspect of a section of the region by the importation of varieties from similar climates. Plant-explorers are now scouring all possible corners of the world in search of plants particularly adapted to particular purposes and climates. This applies also to some extent to the introduction of new varieties of insects and animals. Institutions, moreover, may be borrowed with profit from similar societies; e.g., English parliamentary government and the jury system erected in British colonies; land legislation in Ireland or Egypt adapted to India. Thus we gain ascendency over nature, although in the importation of plants, animals or institutions, evolution does not ignore but utilizes resident forces.

(d) The State, by protective legislation and administration, should preserve the autonomy and integrity of a region from violation, and this in every field, economic, educational or social.

Application of Economic Regionalism.—In international intercourse the above principles may be laid down respectively as follows:

(a) The encouragement of varied production and wise use of exhaustible natural resources in a region, not monoculture as in the tropics, which means intensity of exploita-

tion. For these purposes the resources of the world should be surveyed, climate by climate, along with the human stocks it has bred or may breed.

This shuts out every form of exploitation of labor, open or veiled, and the seizure of lands and mineral deposits and the monopoly of markets by a conquering race. Tropical economics will tend towards a harmonious development of local arts and handicrafts, along with a scientific utilization of raw materials, and away from concentration on one crop or product. Similarly, tropical ethnology will pave the way towards the local development of customary law, land systems, family and other institutions, undisturbed by the individualistic legislation and administration of the Western peoples.

(b) This is the basis of leagues and alliances of undeveloped regions and immature social types with various objects, economic, social, educational, sanitary, etc.

(c) This supplies us with the basis of assimilation of cultures, and similar racial stocks. A true social evolution must be guided by the principle of adaptive assimilation. Crossing of very dissimilar strains or cultures leads to instability and degeneration. Similarly, plants, animals or stocks from dissimilar climates cannot thrive. This helps towards the solution of the problem of distribution of the world's surplus labor among different regions which are now sparsely peopled or inadequately exploited by native labor—a problem which the International Labor Organization sooner or later must deal with, superseding the prevalent less intelligent methods of dealing with the question of emigrant labor.

(d) This is the doctrine of mandates, and in its enlarged

application becomes the Eugenics of Race and Region, in its negative and positive aspects: Negative, in the direction of international supervision over the recruitment and employment of labor, the acquisition of land rights or sale of noxious products, etc.; positive, in the direction of social amelioration, tropical sanitation and hygiene, education, etc. The awakened sense of region which regionalism inculcates, provides a new outlook and occupation for the intelligent nations into whose hands the control of the tropical and backward races has been given. With the growth of the modern conscience in matters economic and the scientific study, region by region, of the natural and human resources of the tropics, which on account of their climate and general environment and the problems of the future are marked out for special treatment by the advanced races of the world, the task of scientific internationalism in conserving and developing these resources becomes imperative.

World Population Problem.—Such a task is indeed forced upon this age by the conflict between races and institutions in Africa and Asia. The race problem is culminating in the twentieth century, and this has its roots in geographical, economic, ethnic and cultural realities, which need scientific comprehension before they can be dealt with in any adequate manner. The most significant and outstanding feature of contemporary world history is the uneven distribution of the earth's surface among the population of different races. The mastery of the Western races has resulted in increased population in undeveloped areas, hitherto thinly populated, and so far has equalized the distribution. On the other hand, the most closely packed Eastern races do not find outlets to adjacent

regions, where colonization and settlement are easier for them than for the Nordic peoples. Moreover, contact with the Western trader has brought about the rapid deterioration and even slow extinction of many tropical and semi-tropical peoples, while accelerating increase in others. The problems of the Asiatic exclusion, the Australian void, the African wilderness, the California or Kenya settlement, the open door and the barred zone, the economic and ethnic struggle in the Pacific, and not least the conflict among the Asiatic races and religions from Asia Minor through India to the Far East,—all form a group of allied problems which should be treated together. For these are features of the present unnatural situation. The world equilibrium has to be reached, and the natural order of the distribution of races and social types found, through the reciprocal adaptation of civilizations and the adoption of economic method which can best utilize the resources of all the various regions of the earth.

Suggestion towards Its Solution.—The outflow of population from the congested human reservoirs into the less occupied regions should be guided by the comparative study of regions, which is a natural link between the consideration of the world as a whole on the one hand and the intensive study of regions and sub-regions on the other. Thus the future streams of men would be directed to suitable regions, to lands as nearly as possible similar to those from which they come. The geographer could suggest the best type of people for certain regions, and the ethnologist would try to find out how far one race accustomed to one type of environment, and especially to one type of climate,

might be able to adapt itself to another.[3] The economist could then indicate how a new land thus peopled might benefit other parts of world by the export of its new produce —a phase of the problem which may be termed land utilization. The methods of land utilization, of course, should be such as would not lead to soil depletion but would preserve the integrity of the region with its various material interests in adjustment. The people must be protected from the use of force and fraud by unscrupulous, profit-seeking merchants and traders, as well as from interference by the imposition of modern notions on primitive and archaic tenures and customs. These latter cannot be judged except in relation to the land distribution suitable to a given region and to its probable capacity for population of a given type.

Protection of Backward Peoples.—The study of bygone methods of agriculture and obsolete land tenures of medieval Europe is now gradually becoming part of a larger sociological study which includes not merely the more primitive periods of European development, but also the conditions which now exist among many peoples in the most sparsely settled portions of the world, most notably in Africa. The history of village life in India and China is also a portion of this more general study of the methods of agriculture and landholding. The broader view of the sociologist tends to emphasize what the jurists and constitutional historians were prone to forget. The various primitive and archaic customs are not merely an historical

[3] Ogilvie: "Modern Geography as a Study and as an Aid," *Scottish Geographical Magazine*, March 15, 1924.

stepping-stone to modern land law; they were methods of organizing rural life that had a significant relation to the economic needs of a sparse population. The laws and customs which we find so difficult to understand were the expression of vital economic needs, and it is not yet entirely clear that the opening up of large areas of new land can be accomplished better under the principles of modern European law. Many changes in agrarian methods and many diversities in the form of settlement are due to changing relations of the population to the land. The legal organization of village life in Africa and Asia is thus only part of the problem, and the merits of a particular method of legal organization cannot be judged except in relation to economic conditions.[4] The experiences of the French in Algeria, of the English in South and East Africa and Northern Nigeria, and of the Russians in Central Asia and Turkestan, all go to prove the necessity of protective policy and administration. Great harm has been done to backward peoples in various parts of the world by an interference with tribal customs and usages, and a substitution of the conceptions of modern land law for tribal and communal notions, which have turned out to be economically disadvantageous and socially perilous. These have undermined native agriculture, concentrated land in the hands of Europeans, leaving the natives impoverished, and, loosening the ties of tribal solidarity and family integrity, have left them without any social control or morale.

World Economics and Administration of the Future.—The theory of the Mandates ought accordingly to be judged from the sole standpoint of whether it will give new oppor-

[4] Usher: *The Industrial History of England*, p. 111.

tunities of progress to backward peoples, and promote suitable modes of soil utilization, while the possibility of acclimatization, and the incapacity of the Nordic and Japanese peoples in particular, both of whom are great colonizers, to establish themselves save within comparatively closely restricted climatic habits, throw light on the future movements of people so as to restore the natural equilibrium of race and region. There has dawned the idea of the world economy based on a fair and equitable exploitation and distribution of resources, both natural and human, without which the world's increasing population will never be at peace. This forms the subject matter of a new science of world economics and a new art of international agricultural and economic administration, with cultivation and remaking of fertility and wise and careful husbandry of exhaustible resources. And this calls for a survey, use and control of the resources of the world, region by region, along with a study of each as an environment most suitable for the human stocks and the animals and plants it has bred or may breed. And, indeed, just as local problems of cultivation are being solved by the importation of plants and animals evolved in similar natural regions, so analogous problems of culture should be soluble on like principles by immigration of appropriate races and the harmonious and sequent development of their qualities and institutions. The application of genetic and comparative methods alone can give that liberal knowledge and breadth of outlook, the lack of which has been so fruitful a source of interracial errors and passions.

CHAPTER XIII

THE REMAKING OF THE REGION

Human Response to Environment.—Man, like the animal, responds to environmental conditions, but his responses differ from those of the animal. Animals have relatively little power to devise weapons of preservation and supremacy outside their own bodies. Man, however, has his tools, weapons and engines, and these he can use and lay aside as he chooses. Thus man does not appear to respond to environmental influences by adaptive modifications of bodily form. There certainly was a time, before he had come fully to his heritage, when he did so respond. There must have been a time when groups of men, no less than the pigs in the forest or the asses on the steppe, were firmly gripped by the physical conditions, isolated from other groups, forced to become fitted by structure and habit for a particular set of conditions, or else to die out. But with his growing intelligence man escaped from this iron grip, learned to make virtually every part of the surface yield enough for survival, proved capable of overcoming every kind of natural barrier. When this occurred the old mechanism of adaptation largely—though not completely—ceased to work.[1] Evolution then might have ceased also, man might have become specially fitted to no environment because generally fitted for all,

[1] For a comparison of social and organic evolution see Thomson: *What Is Man?*, pp. 96-9.

if the factors of fixation and isolation had not, in quite a different fashion, obtained a new hold. He ceased, save on relatively few parts of the earth's surface, to be a continuous wanderer. He settled down afresh on particular parts of it, and there learned to use his increasingly complex brain not only in utilizing to their full the natural resources of his region, but also in modifying the local conditions so that new resources became available. Such modifications became an external legacy with man, while most animals have no inheritance outside of themselves. As man settles down, food and climate have their effects on his psychical endowment and bodily structure and appearance. Different conditions of food and climate have their reactions on skin color, shape of skull, section of hair, etc., as well as on the mental patterns. Diet perhaps acts on the endocrine glands, which regulate the growth of the body, while abundance or lack of vitamines also modifies the features of the racial type. Temperature and humidity are responsible for the form of the nose.[2] The form of the face is closely related to the organs of respiration and of mastication. Thus the nature of food governs the size of the jaw and shape of the skull. The indirect action of labor necessary to secure the food supply also helps to mold the physique of the people. The skeleton bears very definite marks of the type of labor in which a people is engaged.

Cultivation and Cultural Adaptation.—Newbigin suggests that cultivation of the soil was the great agent in insuring the new type of fixation to a particular area which

[2] Thomson and Buxton: "Man's Nasal Index in Relation to Certain Climatic Conditions," *Journal of the Royal Anthropological Institute*, 1923.

once again made evolution possible. But evolution now took the form of increasing development of communal life, or, in other words, the growth of what we call civilization, which is the precise equivalent of specific differences in plant or animal.[3] Concentration on a given area intensifies the struggle for existence, forces the utilization of all the available resources of the region, and thereby in every area stimulates adaptation to the environmental complex, but this time on a higher level. Along with the dominance of a particular racial type in a particular region, we have now the correlation of certain psycho-social characteristics which are associated with a certain culture-complex comprising both the material and the spiritual sides and forming man's external legacy. Man reacts to the available resources of the region. But labor, as represented by the arts of life and the culture-complex, reacts upon him both physically and psychically. Though survival is due more to an adaptation of the culture-complex, yet the purely physical adaptation to the purely physical environment ought not to be ignored.

Labor and Man's Physique.—All the non-temperate grasslands of the world were ordinarily hunting-grounds. The habitat led to similar physiological adjustments, keen senses, stalwart frame, capability of enduring privation, characteristic physical manifestation of katabolism over anabolism, etc., in the human animal. Contrast this with the bodily frame of the pastoral Eskimo living on flesh, who appears to be highly anabolic. The Eskimo from his

[3] Presidential Address in the Geography Section of the meeting of the British Association at Hull, by Dr. Marion I. Newbigin.

youth up puts a very great strain on his jaws by continually chewing skins. Thomson suggests that the peculiar form of the Eskimo skull with its penthouse top is due to the great development of the temporal muscles, which by continual use drag it into this shape. It is also suggested that the eating of cereals in large quantities, a form of diet which necessitates a great deal of mastication, is associated with the form of face and jaw so characteristic of Eastern Asia. Where the air is cold the nose tends to be narrow and converse. The narrowness of the Eskimo nose seems to be in close harmony with Arctic conditions. Not merely the forms of the face and nose, but the limbs of peoples of different habitats show certain differences which may be considered as a very definite reaction of labor on the human frame.[4] Pastoral industry reacts upon the physical constitution, nerve and brain in a characteristic manner, and leads to a specific kind of adjustment under stable conditions. In areas where domestic animals were indigenous, occupational control seems gradually to have involved the short stocky frame of the typical pastoral Mongol. Professor Lyde observes: "If the unconstricted skull is related to the precarious food supply, it ceases to be in any way astonishing that abstemious frugality and intellectual efficiency are conspicuous factors on the economic side of the yellow labor problem." On the other hand, where he did not become a shepherd, as amongst the Amerinds, he did not develop the stocky frame, although in all other respects, e.g., parchment skin and round-

[4] Cf. a very suggestive discussion of such problems in Buxton's *Primitive Labor*, chap. xv; also Duckworth: *Morphology and Anthropology*.

sectional hair, he betrays the climatic control of the non-temperate grass-land;[5] and his scheme of social life and value has been accordingly far different from that of the Mongol.

Social Adaptation.—The principle of adaptation applies to the unity and equilibrium not merely of the individual organism but also of the organization of a social community. The physiological and behavior relations of animals of the same community are of much importance to sociologists, and may be included under:

(a) Inter-physiology or Inter-psychology. Tarde is the author of this idea. He suggests that the social psychology of man may be traced to the inter-psychology and inter-physiology of the lower animals. Among the social animals the character of the struggle for existence is changed with the increase of coöperation, an esprit de corps, and good will. Increase in number and stability have developed a considerable division of labor and an elaborate code of conventions regulating mutual give-and-take in the bee and ant communities. Permanent products have been accumulated by some social animals; such, for instance, are a hive, an ant-hill, a termitary or a beaver village. In the case of man, the social heritage includes, besides habitation, tools and weapons, language, institutions and traditions, which register racial gains. A geographical segregation encourages inbreeding, brings about stability of type and psychical integration by means of similar responses. There is very close and habitual endogamy among the social insects. Characters are fixed and the type stabilized. Kin sympathy is fostered in a homogeneous community. Alike

[5] Lyde: *An Atlas of Economic Geography*, Introduction.

in men and in social animals, we have division of labor and mutual coöperation, which expand into the economic tradition; we have leadership and mastery, kindly emotions and resentment, ostracism and socially enforced punishment, which expand into the ethical tradition; we have the social use of the voice, which expands into language. Human societies, therefore, exhibit strands which go back to simpler animal societies, taking diverse forms according to food, numbers, species and so on. To the strengthening of psychical bonds in the same species of animals should be added the behavior between the different species while acting or living together as one. In the steppes, ecologically similar animals frequently act as species. Again there is seen a close association and companionship of different species of game. In the same way human communities subject to the same geographic influences are made ready to enter into social relations when circumstances are favorable. Thus the desert stamps a certain degree of similarity in character and even greater similarity in language, and assimilates races of most diverse origin which act together when the time comes. "The Bedouins may be and are of many racial families, but the uniformity of physical conditions over all this area, and the absence of the strongest natural influences of separation, cause their life to be organized on such similar lines that they have all come to take something of a common national character from the most vigorous, because best circumstanced, of their kind." Similarly, the tundras impose similar habits of life on the primitive peoples in the extremely trying environment of the Far North. The most distinctive feature of their arts of life is the domestication of the reindeer. Its flesh bulks

as the most important article of their diet, while not only their clothing but also their tents, built at various places on the route of the annual migrations, in which they follow their herds, are made of reindeer or seal skins. The excessively cold polar climate is a terrible strain on the nerves and develops a phlegmatic type of man who can be flat on his stomach for weeks within the tent, without caring what happens outside. We find areas of uniform characterization in deserts, tundras, expansive steppes, plateaux, valleys, etc., where the mountain system with abrupt relief, the chief separator of animal and human communities, is wanting. It is here that we find best illustrated the ecologic significance of a common environment. Among such areas may be mentioned the great tundra of Northern Asia, the steppes of Western Asia, the river valleys of Northern India, the valleys of the Wei in China, the great Russian plain, the Andean highlands of South America, the basin of the Amazon, the South African plateau, the Central African jungle and the interior of Australia.

(b) Inter-*mores* Physiology (between ecologically dissimilar or antagonistic forms). The relation of animals of different size, habits, etc., involves some of the most striking features of behavior.[6] A most fascinating subject recently opened out is that of the manifold and complex relations subsisting between the plants and animals that form one community and their reciprocal adaptations. This subject is illustrated in the phenomena of convergence in evolution.

Community of Interest.—In general, any given feeding area can support a very miscellaneous population, and the

[6] Shelford: *Animal Communities*, p. 34.

association of forms which batten upon any particular source of supply constitutes what has been termed the biocænosis (Dahl) of that center. This community of interest is a phase of symbiosis or commensalism based not merely upon mutual advantage and mutual toleration but also upon strict independence and self-help. A drought or excessive rainfall, or even each slight change in the environment, may upset the bio-economic equilibrium, and, by so doing, it will alter the modes of behavior of the living organisms, thus showing the inter-meshing of the complex web of the biotic community. All the species which take part in such associations may be said to converge towards a common center of subsistence, and this community of habitat leads to similar convergence of character.[7] In human groups we have similarities of modes of behavior arising similarly under the stimulus of a common region.

Uniformity of Regional Group Response.—Group life is a system of responses. The responses are relatively uniform when they are elicited by the common physical environment, and when preparatory and consummatory phases have their full expression, i.e., when there is no inhibition of the native instincts. In such cases even the valuable responses developed through trial and error stereotype themselves into rigid habits and modes of behavior common to all who share the environment. The environment evokes the kind of economic behavior which can best utilize its vegetable and animal resources. Hunting and fishing and domestication of animals, hoe-agriculture and plow-agriculture depend entirely upon regional resources. These govern the spatial relation of man to the soil and the possi-

[7] Willey: *Convergence in Evolution*, p. 114.

bilities of organization and labor. All such factors cooperating determine man's domestic and social life and outlook, his entire mode of life. In different environmental conditions, different human groups arise, hunting, pastoral and agricultural folk. Each of these stages of economic development tends to develop a certain division of labor between the sexes, a particular form of domestic control and of property. Each has its influence on mental evolution, and is correlated with different customs, traditions, and types of culture. It is significant how a common occupation and mode of life are dictated by the common environment, and these mold and assimilate people into a distinctive life group. Ross observes: "A certain mode of life was forced upon the Indian tribes of the prairies which subsisted by the chase of the buffalo. The Eskimos of the Arctic tundra are brought into one plane of practice by the dictate of their common geographical environment."[8] Similarly, the prairie-dwellers and the desert-dwellers were easily assimilated into nomad dynasties and armies under successive leaders. "Among agricultural peoples in an open plain a strong government soon develops, partly because the people desire protection from hungry, swooping hill tribes, partly because the lawbreaker has no safe refuge to fly to, and there is no natural barrier to shelter local resistance. Again, the creation and maintenance of irrigation channels calls for coöperation, and for this reason high political organization first appears along rivers traversing deserts like the Nile, the Euphrates and the Riobamba. Along the Hwangho in China the necessity of controlling the flood waters seems to have forced an early develop-

[8] Vide "The Ecology of the Eskimo" in *The Scientific American.*

ment of the state." Throughout the South-Eastern region in Asia the cultivation of the wet variety of rice, and the regular flooding and draining it involves, have elicited co-operative agriculture and irrigation along with the local self-government of villages and their compact, well-knit organization which has defied centuries of foreign rule. Accordingly as the staple crops are different, such as rice, wheat or Indian corn, there are different possibilities of division and coöperation of labor, and hence of forms of social organization. But the social contrasts as between hunting and pastoral, and pastoral and agricultural communities, are far more marked. The conflict between communities at different stages of economic development is a striking fact in the world's history and ethnology. Thus, the cause of the genesis of states is often the contrast between peasants and herdsmen, between laborers and robbers, between forests and prairies, between highlanders and lowlanders, between country-dwellers and city-dwellers. All this illustrates further the cohesive or knitting force of common occupation and mode of life, preparing human communities for unity. At first it touches only economic interests, but ultimately it affects manners of life, taste, belief and feeling, as well as the deepest chords of human nature.

Marriage Systems Illustrating Response to Environment.—Take, for instance, marriage. In the tropics, where food is abundant, sex relations are most unstable among the primitive tribes, *e.g.*, the Andaman Islanders. On the other hand, in regions where food is scarce and the woman more dependent on man's efforts, natural selection favors a more stable type of sex relation with the authority of the hus-

band and father, *e.g.,* in Greenland, the forests of Brazil, etc. Not merely the duration of marriage but also the line of descent through fathers or mothers is often governed by economic conditions.[9] Ross illustrates: "The institution of polyandry, so repugnant to the jealous instincts of the male, nevertheless appears quite frequently among mountain peoples as a means of avoiding the further division of plots so small that already each barely supports a family." Among many of the Tibeto-Burman tribes, descent is reckoned through the female and divorce is exceedingly common. This seems to have originated in the conditions of primitive existence of some of the Mongolian hill folk, amongst whom there is a strange disinclination to labor on the part of the male. Thus the woman, whose industry is far more important than man's in the maintenance of the family, manages the family plot, and is the more important party in the enforcement of divorces, which are common. Since the children live with their mother, the aversion of the male from labor, which is a socially-induced condition, persists. The imperfect division of labor between the sexes here encourages the instability of the family and the organization of the matriarchate. Ross describes also the effect of hard economic conditions on the marriage forms of the islands in Polynesia. "On islets (*e.g.,* Polynesia) there is soon no more room and the necessity of arresting human increase is obvious to all. Hence infanticide becomes prevalent and in some cases is even enforced by law. Marriage takes the form of polyandry or perhaps an elaborate system of prostitution springs up. The result is a breaking-down of sex morals and a decay of

[9] See Giddings: *Principles of Sociology,* p. 265.

the finer sentiments of the family. Moreover, the constant dread of over-population causes a low value to be set on human life, manifesting itself in neglect of the aged, cannibalism, human sacrifice, slaughter in warfare and a free use of capital punishment." The marriageable age, the system of bride purchase, polygamy or celibacy, widow marriage or remarriage—all these depend upon the age of maturity of women, the relative proportions between the sexes, their comparative value in the dominant occupations, etc.

Religious Response to Environment.—Climate and occupations leave their impress on religion in its early stages. The reverence for the Ganges, the Euphrates and the Nile and the seasonal festivals of the peasant, the worship of the sea by the fishermen in the Bay of Bengal and Arabian Sea, the worship of tools by artisans, are all connected with man's attempts in different ages and climes to establish a close relationship with those natural phenomena and economic conditions which affect his daily life. The conceptions of heaven and hell and myths and rituals are also rooted in the phenomena of nature amidst which man is environed. "The creed of a people is always greatly dependent upon their position on this earth, upon the scenery amidst which their life is passed and the natural phenomena to which they become habituated: the religion of men who live in the woods will not be the same as that of the dwellers in wide open plains; nor the creed of those who live under an inclement sky, the sport of storms and floods, the same as the religion of men who pass their lives in sunshine and calm air."[10]

[10] Keary: *Outlines of Primitive Belief.*

Bionomical Convergence Illustrated.—It is well known that when the animals occupying a relatively uniform habitat constitute an animal community, associative memory plays a part, and it is this which has developed into tradition in social communities of men. There is not only a physiological agreement existing among the animals of a community, but also agreement in reaction to factors of prime importance in the community habitat as a whole and disagreement in respect to factors differing strikingly in the levels in which the animals live within the community habitat. Such agreement is due to (a) the selection of the habitat through instinctive behavior, (b) the adjustment of behavior to the condition through the effects of physical factors and through habits of association. Matters of agreement have, indeed, been experimentally studied. For instance, the fish of a pool community show a striking difference from those of a rapids community in the presence of a strong preference for sand bottom and the burrowing habit, both of which are wanting among the fish of the rapids community. The non-burrowing rapids species are positive to current by the reduction of the air bladder, by the instinct to lie flat on the bottom and the instinct to make short, quick darts from place to place in the swift waters. To this end also, certain fins in each case are especially increased in size and force. Another interesting example of bionomical convergence[11] is that which is presented by the social insects, ants, bees, wasps and termites. Both the ant-nest and beehive include three kinds of individuals: at least one queen mother, who

[11] Willey: *Convergence in Evolution*, p. 119; cf. also Wheeler: *Social Life among the Insects.*

has lost the domestic art, a number of short-lived males, and a crowd of workers who have lost their maternal functions. The termites have always a reserve of reproductive members. The other difference between termites and ants or bees is that in the latter the workers are highly developed, though sterile, females, while in the former the workers seem to be arrested forms of both sexes. The termites so much resemble ants in their mode of life and social organization that they are commonly known in the tropics as "white ants," though they are not ants and are not always white. Not only have they no direct genetic relationship with the true ants, but also the latter are among their most formidable enemies. To what is this convergence due? It is probable that the hard conditions of existence have developed among different species of social insects the art of laying up provisions for the future, as well as the art of domesticating slaves. Mutual aid and specialization of the functions of provision for the future and reproduction, which are most essential for the survival of the species, have become biological habits and have led to structural differentiation. They are, as it were, nature's experiments in trial and error. Indeed, wherever the social organization is perfected, the species has been successful. Sociable like man, social insects, by this means, have achieved the harmony and effectiveness of a perfected organization which seems to realize the dreams of Utopians. In the process of survival, they have undergone an evolution parallel to man's; but, while polymorphism is the basis of mutual service and division of labor among insects, man has achieved the same result by his intelligence and social consciousness. The industries of the termites and some

species of ants and bees are marvelous, and often show skill and foresight comparable to man's economic activity; but, what man has accomplished by individual skill and communal consciousness, the insects have achieved by physiological division of labor, by rigid and automatic instinct associated with an hereditary specialization of organs. Thus, while the fundamental industries of man are dispersed throughout the insect world, the same kind of polymorphism appears again and again in different species of social insects which have reacted in the same manner as man, under the influence of the same environment, to insure the supply and provision of subsistence. It is interesting to note that in East Asia, where we find the organization of social insects developed to perfection, there also has been seen among human associations a minute and even rigid specialization of functions, along with ant- and bee-like societal integrity and cohesiveness. The bionomical resemblances between insect associations and caste-ridden societies, indeed, are amusing.

Evolution of Specialized Types in Isolation.—The principle of geographical adaptation is limited by the raw material upon which adaptation has worked, and which is not the same in all parts of the globe. Thus, animals inhabiting dense forests generally show arboreal adaptations such as the prehensile tail, the opposite thumb and great toe and so forth, found wherever the forest occurs. But there are different types of adapted animals in different isolated forests. These are accounted for on the hypothesis that the specialized forms in each separate region have been evolved from preëxisting unspecialized forms inhabiting the region. Thus, when any stock of terrestrial animals

reaches a new region, and is there isolated from any cause, that stock will tend to give rise to specialized groups, more or less adapted to all the possible varieties of habitat which the region affords. Again, in order that a particular stock may give rise by specialization and differentiation to many such groups, some degree of isolation seems to be necessary, for otherwise new incoming stocks may colonize the vacant places before the first stock has had time to become differentiated.[12]

Procession of Adaptations: Social Heritage of a Region.—Thus there is, first, an intimate relation between the vegetative covering and the physical conditions. The existence of the great plant associations depends upon the climate, the relief and so forth of the region. Secondly, there is also an intimate relation between the animals of the various natural regions and their surroundings. The dependence of the more active animal, and especially of man, the most active animal of the ages, upon his surroundings, is less intimate than that of the passive plant; but still the physical characters of man tell us something of the physical features of his region. Apart from the direct effects of climate and food on man's physique, the climatico-botanical region through the indirect action of labor necessary to secure and make use of the food supply molds the human frame. A definite type of labor imposed by climate and the regional conditions makes for the selection of a particular racial type suited to the region. But man's adaptation takes also the form of mental and social accommodation. Thus a type of culture comes to have a

[12] See Newbigin and Bartholomew, Clarke and Grimshaw's *Atlas of Zoögeography.*

certain correlation with the physique of a people, both registering the trials and errors of the environment.

However, a racial type is not rigid, but plastic and fluent. As a people migrates to a new region and adopts a new economic method and type of labor, the racial type becomes altered or else imposes at least part of its physical characters and part of the typical elements of its culture upon another people. It is thus that the wanderings of people have brought about significant historical changes in the culture and the physique of large areas of the earth. These have been especially witnessed in the belt of steppes, with their specially active record as the "historical zones"[13] *par excellence*. But apart from migrations, which account largely for the modification of racial characteristics, fraught with significance for the survival and extinction of races in different regions, we confront changes in the environmental conditions themselves. These upset the established equilibrium of the living community with which was associated a particular racial type. The geological and climatic changes, gradual or catastrophic, lead to sweeping modifications in the composition of the flora and consequently of the fauna which bring about a new bio-economic equilibrium. Forms of existence at any given time would perish gradually as their habitats were narrowed and the limits of their power of accommodation and acclimatization were reached. As with vegetation we have a succession of plant formations, there is a corresponding succession of animal communities. Gradual modifications by which a long series of forms, each slightly different from its immediate progenitors, have been shaped are found

[13] Febvre.

among both animals and men. But man does not play the passive rôle. There is selective adaptation and control of plants and animals to suit man's own needs. Owing to man's presence and interference with plant and animal life, the whole stamp of a region is modified and this recoils upon human life for good or for evil, through long and indirect trains of circumstances scarcely discernible amidst a confusion of causes and effects. Marsh observes: "The question of animal and vegetable life is too complicated a problem for human intelligence to solve, and we can never know how wide a circle of disturbance we produce in the harmonies of nature when we throw the smallest pebble into the ocean of organic being." Once these forces are let loose, they cannot be checked, but pervade the entire circle of man's life and well-being. Man's adaptations include a control, an increased utilization, and an extension of the environment. There is an evolution of man's mode of life and social organization, of his interests, habits and temperament, of his relationship to the vegetable life around him and to the animals he cherishes. Specialization in pastoral activity, in intensive agriculture, or in industries, represents different types of relationship to vegetation and animal life, and this affects the region no less than it does the physique and the social life and character of man himself. The form of group life is as much the result of truly geographical conditions like climate, fertility, topography, etc., as of the presence and absence of certain plants and animals, as well as of human factors like density of population, security of life, etc. The regional and social factors coöperating have different possibilities of number and stability of groups, different possibilities of division

and organization of labor, and different types of culture under different environmental conditions. Thus man's influence is traced in manifold and unforeseen ways on the region and the region becomes at once his handiwork and his heritage. The region, thus conceived, registers the gains of trial and error for ages, and gives man handy tools and weapons, folk-ways or customs which make life easier and smoother for him. It therefore serves as a selective agency for the mental traits of the individuals, which, as well as the bodily characters, are molded into characteristic patterns. Individuals who possess the same mental patterns become *solidaire*. On the other hand, the social heritage trains the individuals into *rapport* with the region, directing their native instincts along certain common channels. Thus a distinctive region which evokes similarity of response and the legacy of occupation, tradition and culture—each reacting upon the other—imparts to the group a unitary character.

Biological Method in Sociology.—The scientific sociologist who borrows from biology the method that coördinates his science with natural history thus begins his work with an examination of the several traits in social forms that he can fix upon as furnishing clues to a sound natural classification. The homologies of forms, whether of biological or of social organisms, which the scientist discovers, can themselves tell a story in evolution. Thus the life history of each variety and form has to be comprehended and collated with the general law of evolution. The classification of forms is rendered more accurate as we study each form not merely in its static aspects but also with reference to its place in the evolutionary series.

But human history is different from natural history, though the latter supplies much of its essentials and mode of treatment. Man builds up a race and culture environment, which dominates the evolution of types and regions. The explanation of these in terms of biological processes accordingly becomes inadequate. While starting from the platform of natural history, our aim accordingly is to revise the classification of social types arrived at from the standpoint of Biological Ecology by a due consideration, at ascending levels, of the formative factors of race and material culture as developing entities which, together with the environment, constitute the ensemble which we may call the "cultural" region.

Study of a "Cultural Region."—A region thus considered is first a series of stimuli like climate, food, physical and chemical properties of soil, topography, etc., that directly or indirectly through their effects on man's internal secretions and through types of labor govern his physical characters, which in turn determine certain mental characteristics.

Secondly, the region, by governing the nature and kind of crops and natural resources, the density of population and the technological apparatus and processes developed in the course of their transformation, indirectly influences mental and social evolution. The methods of organizing village life, for instance, have a significant relation to the economic needs of a large or sparse population and the relative scarcity or abundance of land resources, and the social and legal organization of village life cannot be judged except in relation to economic conditions. The influence of the reciprocal adaptation of economic and legal factors

is perfectly definite in its nature. The advance of civilization and the improvement of technic and political conditions react on each other, an advance in knowledge permitting an improvement in economy which in turn provides the necessary freedom for a further advance of civilization.

Thirdly, the environment also changes. Thus, there are climatic changes with which the environment of man and his habits of life change. Such changes are cyclical or occasional, slow or catastrophic, with different effects on man's congregate life, discerned at their best, as Huntington has so ably demonstrated, where races dwell under marginal climatic conditions accompanying the apex of a climate cycle. Chinese Turkestan and Kashmir may be taken as typical of the effects of changes of climate upon the arid regions of the world, on the one hand, and upon the moister temperate regions, on the other. In Turkestan, the effect of increasing aridity was to drive away the nomads, and to diminish greatly the number of persons supported by agriculture, compelling many to become semi-nomadic shepherds or fishermen. Everywhere in arid regions we find evidence that desiccation has caused famines, depopulation, raids, wars, migrations and the decay of civilization. In the moist region of Kashmir, on the contrary, higher temperatures and diminished snowfall have made for progress. The nomads of ancient times have adopted the pursuit of agriculture; the number of people whom the region can support has increased manifoldly and all manner of arts and crafts have been encouraged. The civilization of Kashmir is low compared with that of

Europe, but it is far in advance of anything to which pastoral nomads attain.[14]

Lastly, the region, as a common and coördinate set of stimuli, evokes a similarity of responses, habits and feelings which are reinforced by gregariousness developing the characteristic social heritage of a particular people, not less important as a formative factor in social evolution than the geographic environment. The region is at once a stimulus, and a result of reactions which have become crystallized into institutions. Thus, physical characteristics, social tropisms, instincts, repetitious acts, sentiments, acquired habits and institutions belong to the same series of phenomena in the process of development of different reaction systems by peoples in different environmental and genetic conditions. It is for this reason that, when a group of people migrates to a new region, it finds its social heritage incompatible with the economic method necessary for utilizing the new available resources. Thus, while different groups at different times passed through successive stages of economy, there may have been periods in history when the existing highest stage was lower than that obtained by vanquished groups of the past.

Components of Regional Sociology.—Such a regional view of sociology will weave together the following divergent strands of thought. It will regard social, economic or political life as intertwined with the whole social organism of any given time and place and accordingly will find a general correspondence between the institutions, economic, political, juristic and other, in the same type or region.

[14] Ellsworth Huntington: *The Pulse of Asia.*

It draws its inspiration from the fundamental doctrine of the historical school, though it will broaden its scope and field of survey by devoting special attention to Eastern institutions which have been more or less neglected. Thus the larger outlines of Sociological Economics, which first became prominent in Schmoller and later in the American sociologists, will be broadened and enlarged by the comparative and genetic methods. Secondly, it will derive support from the line of social investigation undertaken by the school of Le Play, with its concrete treatment of the interrelations between Place, Work and Folk—an occupational analysis which has been endowed in the hands of Patrick Geddes with rich practical significance in a renewed application of sociological method to social life in definite cities and regions.[15] Thirdly, this line of social inquiry will be based also upon our increasing knowledge of social anthropology and collective psychology as new allies of geography. An investigation into the distribution of physical and mental characteristics in particular regions is a field of scientific study just touched by Professor Fleure and others, while an inquiry into the distinctive mentalities and ideals of peoples begun so brilliantly by the school of Le Bon and recently followed by Thorndike, Woodworth, McDougall and others has not been sufficiently fruitful as a

[15] Patrick Geddes is advocating a new bio-sociological method, which is at once practical and illuminative. According to him, the data of the problem are on lines like the coördinates in geometry, quite clear-cut: Organism, Function, and Environment; Folk, Work, Place. Like Descartes's mathematical coördinates, like Darwin's biological coördinates, so the sociological coördinates must remain—Folk, Work, Place; and the whole of sociological inquiry must be in that framework. (See Thomson: *What Is Man?*, p. 98; Geddes: "Essentials of Sociology" in *The Indian Journal of Economics*, 1922.)

means of scientific classification in Race Psychology. All this has further delayed an inquiry into the natural history of social types; moreover, while the general concepts of biology have profoundly affected the social sciences, there has been no serious attempt in sociology to utilize the methods developed by the biological sciences in the study of plant and animal distribution. A careful and intensive study of the regions or little wholes of humanity is the best introduction to studies in sociology. Paul Vidal de la Blache observes: "The notion of natural region is simply the expression of a fact brought more and more into evidence by the observations which have been carried on for a century: meteorological observations showing that the averages for temperature and rain hardly vary in a given region; botanical observations showing in the same climates the reproductions of the same type of plants; geological observations proving that if there is great variety in the constitution of the soil, all is not disorder, and that the very way in which the sediments have been deposited, in which the movements of the earth's crust have taken place, implies a certain regularity of behaviour." To these we now add an approximation in the physical, economic and psychological types in the same region. Thus a close and analytical investigation into the small natural unity called the region, which reveals the relationships between geographic conditions and social facts, is the best prelude to a study of comparative social economics.

CHAPTER XIV

THE CONFLICT AND FUSION OF REGIONAL TYPES

Phenomena of Contact and Intermingling of Peoples.— As we have seen, the interaction of environmental and social factors endows the region with a definite type of culture which cannot be interpreted in terms of mere geography. The region is transformed into an ensemble of common traditions, customs and language. These mold the behavior of persons in different social groups into characteristic patterns which prevent common participation in a particular social situation. But the evolution of social types is not so simple as is presumed from the above analysis. From very early times there had been contacts and transmissions of cultures. When exogamous amalgamation took place the differing social types held by the male and female slowly blended, and cults, weapons, modes of livings, etc. were borrowed and assimilated. It was observed, however, by Rivers, in his investigation of Melanesian and Hawaiian cultures, that the basic system of relationship and family life remained practically unmodified in spite of profound transformations in technique, in language and in religion. It is thus that in primitive times, in spite of mutual intercourse and accommodation, the system of kinship and family organization which is the foundation of the social structure, furnished for different tribes the permanent physical substratum upon which tribal conflicts and animosities gained strength and volume.

Tribal integrity, however, could not withstand the actual intermingling of peoples or the most profound changes brought about by conquest and forced superimposition. Thus, whenever and wherever the economic conditions resulted in large immigrations of conquering peoples from less congenial regions, we often witness what we may call the obliteration of regional social types. Much ancient history is to-day explained by the conquering march of the "Children of the Sun" from Egypt, who brought amongst remote peoples and regions the dual organization of society, with its social effects upon the institutions and beliefs of both the governing classes and the common people. There are traces of the existence in Polynesia of a sun-cult, and the chiefs were children of the sun: these were characteristics of the archaic civilization. The same holds good for those parts of Melanesia and Micronesia where signs of the archaic civilization are most prominent: the children of the sun form the ruling class, and the same obtains in Indonesia. The sun god almost universally has been replaced, usually by a war-god, and there has been a corresponding change in the habits of communities. In the Pacific, the rise of warfare coincides with the degeneration of culture in the arts and crafts. In the medieval age in Europe the propagation of the Roman culture was greatly facilitated by the settlement of the Romans in every province. The Roman villas were nuclei of the diffusion of Roman institutions. The phenomena of the conflict and fusion of regional types are varied. As on the physiological level the intermixture of very dissimilar stocks is fraught with grave consequences, so a striking disparity in regional social types is unfavorable to the development of a higher

civilization out of the union of meeting races. Instances already have been adduced of vigorous but barbarous stocks in Africa and Polynesia which have prematurely deteriorated or disappeared as a result of contact with advanced races. The loosening of tribal ties which ruined morale, the supersession of communal by individual ownership in land which led to idleness or luxury, had the same deleterious effects upon the body politic as the importation of drugs, narcotics and diseases had upon the health of these peoples. Thus many regional types represented by backward and less organized peoples of the world are today being swept away by conquest or extermination, as well as by the slow injection of poison into their system by conscienceless members of civilized peoples.

Purity of Race: Measures for Its Preservation Taken in India.—On the other hand, an old but less organized regional type, with due resources and a conservative social organization, will adopt defense mechanisms when it has to face the inroads of an aggressive, overpowering culture. This is inevitable when a large population can be easily multiplied and maintained in the region without racial intermingling. Such defense mechanisms are connected with attempts to prohibit or check social intercourse with the stronger, alien culture. Social restrictions against intermarriage and inter-dining, conventions of untouchability and unapproachability, are resorted to by subject peoples in their zeal and anxiety to protect their social types from contamination. The social taboos against mixing with the Muhammadan and English masters in India are well known. Social groups in India have become clannish and conservative to a degree, and offered barriers not

merely to intermarriage but also to social intercourse to prevent the obliteration or absorption of their culture elements. Thus the forces which stereotyped castes in Aryan India in the past are far different from those which maintained them in Mughal or British India. The need of maintaining race purity was emphasized in ancient India by the presence in society of heterogeneous and most backward ethnic elements. The ancient law of *anulome* and *pratilome* marriages as given in Manu was strictly adhered to. The superior classes might take women from the inferior race, but a certain pride of color remained in them, so that to avert complete amalgamation they did not give their women and would close the ranks to further intermixture as soon as their number had increased to the point where the dangers of endogamy were negligible. While the more primitive occupations were left to the original inhabitants, who were gradually grouped into hunting, fishing, basket-making and agricultural labor castes, the handicrafts and other intermediate occupations were followed by the mixed stocks who were in closer contact with the immigrant conquerors than the pure aboriginal castes. It was thus that the formation of castes and sub-castes proceeded apace, the caste in each case standing for purity of blood and a correspondence traceable between caste gradations and the variations of physical type.

Caste and Other Social Race Barriers in India.—In those parts of India where the immigrant superior castes were in a microscopic minority and the dangers of amalgamation serious, race and color prejudice were inextricably woven into the texture of castes and strange and inconvenient practices of segregation grew up. Caste has assumed

harshest aspects wherever the racial elements have withstood assimilation, but in the peaceful evolution of village communal life in the fertile river-valleys where an increasing pressure of population on the soil and the contact of peoples for centuries directly encourage social cohesiveness, one caste shades into another as function or occupation does. In Muhammadan times, the dangers of amalgamation of race and function were again realized, and then the subject society sought to prevent social mixing between the natives and foreign masters, which would spell social disaster. Thus the social organization adopted "the habits of the tortoise," to quote the Indian phrase, for self-protection, and encrusted itself deliberately and elaborately with social restrictions and injunctions. The Hindu and the Muhammadan lived side by side in both cities and villages, and this more than any other factor contributed to give rigidity and fixity to the gradation of society on religious and racial differences. Communal autonomy and non-interference with religious practice soon became established traditions, while peaceful intercourse in non-social, non-religious matters was also gradually sanctioned by usage. Direct and personal relationships as, for instance, in the family and in social intercourse, which makes assimilation inevitable, were tabooed. It is true that the easiest method of racial assimilation is domestic slavery, but nothing contributes more to the degradation of both masters and slaves.

Negro Question in America.—In the United States the race-feeling due to the color contrast is strengthened because the Negro performs mainly the deeds of drudgery or the more menial offices of industry, while it is this very

servility which jeopardizes character. In the South the Negro obtains his chance in the commercial world. As a Negro leader observes: "It is in the South that the black man finds an open sesame in labor, industry and business that is not surpassed anywhere. It is here that that form of slavery which prevents a man from selling his labor to whom he pleases, on account of his color, is almost unknown. We have had slavery in the South, now dead, that forced an individual to labor without a salary, but none that compelled a man to live in idleness while his family starved." But both in the North and South the Negro bears the impress on his character of his past social history. The tearing away from the African fields and the time-honored rural, communal standards and the state of dependence and subserviency have perpetuated social inferiority until the new opportunities of education and large-scale industry have given the Negro the chance to gain knowledge and wealth.

It was the enormous demand for cheap field-labor in the cotton plantations of the South that was the chief cause of bringing the Negro from Africa during the years preceding 1808. Nearly nine-tenths of the colored population still live in the South, particularly in the great agricultural plain stretching from Virginia south-westward to Texas. They live mostly in the villages and are engaged in the cultivation of the soil. But more than a million have come northward, migrating to and living mainly in the cities, as a depressed and unassimilable caste.

Immigration Phenomena in the United States of America.—The rapid expansion of American industry and commerce in the North similarly invited the enormous immi-

gration from Europe during more recent years. It was estimated at the outbreak of the World War that a third of the American people were of foreign parentage, while the foreign-born numbered between 16,000,000 and 17,000,000 —certainly the largest body of strangers any people ever has engulfed. The great majority of these immigrants have gone to the large cities where work is most easily found. It is thus that these immigrants have built up the great structure of American industry. The United States Immigration Commission in 1909 found that four-fifths of the operatives of thirty-eight great industries were either foreign-born or the sons of foreigners. Since 1909 the immigration has been heavier and there has been greater displacement of American labor. But what promotes prosperity complicates the social situation. Large immigration results in making a heterogeneous cosmopolitan population which is not uniform in physical and mental characteristics and can be made uniform only by a long-continued process of reciprocal adaptation of stock and region.

Professor Boas found as a result of his inquiry into the physical characteristics of immigrants that the American-born descendants of these differ from their parents; and that these differences develop in early childhood and persist throughout life. It was found that the head form, which always has been considered one of the most stable characteristics of human races, undergoes far-reaching changes due to the transfer of races of Europe to America. He concludes that we are justified in the conclusion that the removal of the East European Hebrew to America is

accompanied by a marked change in type, which does not affect the young child born abroad and growing up in American environment, but which makes itself felt among the children born in America even a short time after the arrival of the parents in this country. The change of type seems to be very rapid, but the changes continue to increase, so that the descendants of immigrants born a long time after the arrival of the parents in this country differ far more from their parents than those born a short time after the arrival of the parents in the United States.[1]

Aids to Race Assimilation in the United States of America.—While there is a gradual accommodation to the physical type of the region, various cultural factors promote the process of assimilation in temperament, tastes and character. The public school teaches the English language and stresses distinctiveness of America's political traditions, common interests and ideals. Similarly the newspaper inculcates a common viewpoint and develops new and common public opinion. The consumption of identical reading-matter by peoples of different regions obliterates differences of race, religion and culture. In economic life, large-scale standardized production daily throws on the market the same variety and pattern of goods, while the exposure to identical publicity, advertisement and sale agencies develops common tastes and fashions. The trade-union groups men according to occupations, refuses to recognize race or nationality, and directs the social forces to an identical channel. Young people of different ethnic groups are absorbed in the same political campaign. Lastly, the social

[1] Boas: *Changes in the Bodily Form of Descendants of Immigrants*, p. 52.

mixing and intermarriage between different population elements, carried on for several generations, complete the process of assimilation.

Immigration Problem of the United States of America; Negroes and Japanese.—In two extremities of the world, in America and South-East Asia, we find remarkable experiments of reciprocal accommodation and assimilation among intermingled ethnic groups. In America the color bar presents a serious obstacle to race-blending, as well as to social mixing. The social separation between whites and blacks, especially in the Southern states, is as absolute as ever it was, and the economic traditions of the slave and the semi-slave farm-hand still continue in spite of the spread of vocational schools among the Negroes. Similarly, on the Pacific slope, the Japanese, who have introduced a more successful type of intensive agriculture and fruit-growing, represent to the whites an unassimilable race, and the color line which makes race intermixture impossible now has forced the exclusion of these immigrants. Another serious obstacle to assimilation is presented by the large volume of immigration within a short space of time. From 1783 to 1820 it is estimated that not more than 250,000 immigrants came to the United States. During 1820 to 1920 it is estimated that more than 30,000,000 immigrants reached the United States, which is the largest population movement on record. The recency of settlement, on account of which the different population elements cannot settle themselves in stable relation to fixed regions, and the colossal task set before the public educational authorities and private organizations, delay and often thwart the processes of accommodation. Thus the problem of social assimila-

tion, in its various phases, remains an unsolved problem in America.

Chinese Race Assimilation.—In vast regions in the Far East and Further India, the Chinese have absorbed strange peoples and cultures. In Central Asia the Chinese show by their support of Buddhism and their agricultural colonies how the barbarism of mounted nomads can be tamed. China has subdued the perpetually turbulent nomad tribes by a peaceful penetration of Buddhism, which makes them docile, and substitutes pilgrimages to Tibet or to famous Mongolian sanctuaries for the old predatory and warlike raids. In the eastern half of Further India, which is grouped with China by land and sea, and whose race stock is largely, if not purely, Mongolian, the Chinese influences are exceedingly well marked, so that the whole continental rim of the South China Sea from Formosa to Singapore is strongly assimilated in race and culture. The Cambodians bear a strong impress of both Chinese and Indian civilization, while in Annam the Chinese influence is unmixed. As in China, the idea of collective solidarity, the conception in groups has legal consequences. The masses retain their preference for ancestor worship, and the cult of the family has as important social and political effects as in China. The monarchy in Annam and Tonkin is Chinese in its conception, a bureaucracy with a prince at its head. Throughout these regions, as in Siam and Burma, Indian, Chinese and aboriginal influences are hardly separable in beliefs, customs and social institutions, while the Mongolian stock is soaking gradually through populations which are by no means assimilated into Chinese society.

Regional Conditions and Race Assimilation.—Both in China and India the very large and independent land-mass allows of a more or less equable and uniform diffusion of population and maintains it in so great numerical force that alien intermixtures are powerless essentially to modify the gradually developing regional type. Conditions of social assimilation are far more difficult in America, where immigration is larger in volume and extended over a shorter period, and the regional distribution of raw materials and mineral resources encourages urban concentration. Both in India and China the mode of distribution, as well as the mode of subsistence, produces homogeneity of culture and similarity of social forms and conditions of production over large regions. In the case of China, the highlands of the West also offered some protection against the inroads of outside nomads, and the nomads that came were subdued and absorbed in the boundless plains. It is only in Southern China that the mountains with their unsubdued tribes are like political islands in the midst of the Mongolized hills and plains.

Indian Race Assimilation.—In India the inroads of alien stocks have been hindered by the difficulties of the North-Western gateway and the natural barriers which divide Hindustan from the Deccan and separate the coast regions of the East and the West from the interior of the peninsula proper. Secondly, the rise of fortified garrisons and of states and principalities along the great plains of the rivers, into which invasions are forced, limited the sweep and volume of immigration. We have seen already that as invaders came to India, and settled in the land, they were compelled to marry women from the country itself. Social

solidarity accordingly demanded the organization of ethnic groups to prevent indiscriminate mating and intercourse under the pressure of alien invasions, as well as under the handicap of too many heterogeneous stocks. In the great river-plains the settled village life in a limited area encouraged social assimilation, and one ethnic group fused with another under the influence of the customary law and usage and the coöperative habits in agricultural-communal life. The degree of this blending of race and fusion of function was different in different regions. In those parts of India where the difference of race and culture level was the greatest, the need of maintaining race and culture purity expressed itself in those harsh customs of untouchability and unapproachability which otherwise are so unintelligible. Throughout the country, however, the original Munda-Dravidian folks gradually became comprehended within the Indo-Aryan fold, and it was they who greatly determined the structure of social government and agricultural organization of the country. The semi-Hinduized aborigines were assigned a place as castes and tribes on the lower rungs of the Hindu social ladder, and they gave to India the compact, efficient village organization, the *panchayat* rule, the indigenous village police, the allotments of lands from common village settlements for village officials and servants and the hierarchy of caste tribunals modeled after tribal administration; while vast hordes and numberless tribes from Madagascar to the Eastern Archipelago, who came to be comprehended within Indian culture, have exhibited some of these institutions which have their roots deep in India's prehistoric soil.

Cultural Unity of India and China.—Throughout South-Eastern Asia, different ethnic groupings work together or enter into relations and bear the impress of common cultural traditions which are molded by geography. There is thus an approximation of physical and mental characteristics to a gradually unfolding ethnic type, the outcome of an age-long process of reciprocal adjustment of people and region. The unity of India and China is not a unity of government and organization, but a unity of social inheritance or culture, among heterogeneous stocks who are assimilated into a similar physical-psychical type.

Communalism, the Eastern Bond of Peace.—The polyethnic masses of the East have lived in social peace because the different population elements enjoy the utmost measure of autonomy. Both in China and India a catholic and synthetic policy of assimilation of different stocks and nationalities has kept alive communal self-government and local home rule. Thus the problem of uniting large areas and great and heterogeneous populations has been solved by the principle of communalism. The government in the East concerned itself with little else than order and defense, leaving each population element to organize as it pleased and provide itself with its own laws, temples, schools, recreations, etc. The Teutonic nations, however, have devised the plan of delegation and representation for reconciling the interests of order in a large territory with those of responsible citizenship. In the West the principle of representation often has been aided by the consolidation previously effected by absolute monarchy. In the East the communal-federal principle was the long-established traditional solution of the social problem presented by the inter-

mingling of stocks on different levels of social development. Through failure and long endurance the East has clung to the principle of culture autonomy as the only effective protection against social outbreaks.

American Race Problem.—America to-day is the meeting-ground of the conflict between the principle of free and equal citizenship and the principle of self-determination of civilization. The democratic assumptions of her Constitution are incompatible with the social, political and economic disabilities of some of her ethnic groupings. Such disabilities are incompatible with that like-mindedness and solidarity without which no democracy can succeed. And yet the economic and civic conditions which are associated with all that America understands by civilization must not be leveled down by working on the abstract hypothesis of the equality of man and race, nor are the cultural agencies so quick and effective in their operation as to orient the medley of peoples in the direction of common interests and ideals. Abstract postulates will retard the solution of the problem. What history conceives and nature rears cannot be made by one century of education and social effort. Thus, since the process of social assimilation remains incomplete, the situation presents innumerable occasions for compromise, so that the ethnical and cultural groupings may learn to work together instead of fighting with one another. A heterogeneous nation is bound eventually to accept the principle of federalism and cultural autonomy as a matter of social necessity. In occupation, social habits, education and language, the American immigrant is quite unlike the native citizen. Ten percent of the adult population are unable, for instance, to read the laws of the State.

Socially, segregation and non-comprehension exist among distinct, independent groupings. Thus the path of social progress lies in cultural autonomy and communal management of schools, churches, vocational education and social recreations, while community service and civic institutions will serve as binders of the various distinct and equiponderant population elements. Nothing will promote better the cause of race assimilation in America than the reconciliation of her ancient principle of free, common citizenship and the new principles of regional and cultural autonomy among the diverse ethnic elements not as yet Americanized.

CHAPTER XV

GENETIC SOCIOLOGY

Sociological Sciences Not Coördinated.—Herbert Spencer introduced into the study of society the comparative method of sociology. A brilliant group of thinkers followed in the wake of Spencer, making intensive and distinct studies of the different phases of civilization. Religion, art, social organization, economic institutions, all came to be comprehended within a separate monographic treatment. From this have been set up certain fixed stages and norms of development through which an institution or form of society is supposed to pass in different parts of the world. Nevertheless, historical research exhibits differences in order of stages and even of lines of development. It is now realized that in sociology scientific laws can be arrived at only as we reach a scientific classification of social types, even as the rapid advances in biology were possible only when the main outlines of classification had been more or less accurately defined. Sociologists now investigate geographical, ethnic and other factors which enter into the formation of different types of social organization. Indeed, these have been the particular achievements of the comparative and historical investigations in the fields of jurisprudence, religion, philosophy and ethnology, characteristic of the last decades of the nineteenth century, with its newly-aroused interests in folks and institutions outside the pale of European civilization. Unfortunately such studies traced the

lines of development in a particular sphere so that a unified and synthetic treatment of society was wanting. Thus, the conclusions of economics, politics and anthropology often missed the unity of the social process, while there prevailed also a good deal of misconception regarding the origin and stages of social development as a whole.

Stages of Social Development Not Absolute.—Secondly, there was an attempt to mark off stages in culture too absolutely. There was an inadequate recognition of the fact that the order of development depends on the general environmental situation, and that social types need not pass through all the rudimentary forms in logical sequence. Thus nomadism and the pastoral life form a culture stage, which is very important and widespread, but by no means universal. In the New World, for instance, the pastoral stage was missed entirely. Muller-Lyer observes: "There was big game in abundance—buffalo, deer, reindeer, but none that were easily tamable; on the other hand, there was a field product of extreme utility and easy cultivation —this was maize. Thus the Red Indians became husbandmen without going through the shepherd phase." In the Old World there were numerous varieties of edible plants, especially cereals, which were difficult to cultivate; and, on the other hand, there were a great number of tamable animals: the horse, ox, sheep, goats, etc. Thus the inhabitants of the Old World were predominantly cattle-raisers and only took up husbandry at a much later period. Similarly, the African tribes are stock-keepers, agriculturists or hunters indifferently, without regard to their cultural status. The Ancient Mexicans had never any pastoral period, and were agriculturists. It is probable also that the

nomads of the Arctic Sea, the Tibetans and other inhabitants of Higher Asia, went over directly from the hunter stage to the pastoral. Other examples of regional peculiarities are furnished by the different manner of life among the fisher races of North-West America and North-East Asia, the rise of free industries and handicrafts among the African races, and the organization of communal agriculture and industry among the Chinese, Japanese and Indians. Therefore the order of development is different in different human groups. It depends upon the traditions of utilization of resources and of subjective and objective utilities of the region and upon inventions under the stress of crises, both of which contribute to mold economic development differently in different environments. Further, the limitation of the resources of a region often led to a combination of the three economic pursuits into which the evolutionist usually divides economic history.[1] We know to-day that while hunting is unquestionably one of the earliest economic pursuits, it persists through all subsequent stages; that agriculture was practised by many tribes that had never passed through a pastoral stage, nor kept domesticated animals, excepting the dog, a condition exemplified by many tribes of North America. Again, in Negro Africa, agricultural and pastoral life are pursued on an equally wide scale. Historic agriculture, moreover, which involves the domestication of animals as well as the cultivation of plants, in so far as animals are used for agricultural purposes, represents a much later cultural phenomenon, to be distinguished clearly from earlier agriculture, in which the domestic animal and the

[1] Cf. Febvre's critical discussion in *A Geographical Introduction to History*, Part III, chap. iii; also Bos: "*Archive internat. d'ethnog.*" xi.

plow were unknown and the only agricultural implement was the hoe.[2] Again, the stages of cultural evolution are usually conceived as gradual and the history of man envisaged as consisting of slight, slowly-accumulating changes. It is true that history makes us familiar with slow changes in attitudes and beliefs and in material culture; but we should not forget sudden changes brought about, for instance, by wars, diseases, important inventions or new culture contacts. Sudden progress also is achieved by a race through a change of environment when it emigrates into new regions that offer far more favorable conditions than were enjoyed in the old habitat, and enable it to pass to a more developed social and industrial organization by skipping the previous stages. Indeed, the stages in social development cannot be regarded as general, nor is there an order of their occurrence which applies to all regions and races indifferently.[3]

Undervaluation of Non-European Standards by Europeans.—Thirdly the political superiority of the European races stood in the way of a right appraisal of the works and experiences of the less advanced and less organized races of the world in general. There was a predisposition to judge the customs and institutions of the various human races by the standards of European culture, even to regard those institutions which did not correspond to European institutions as initial and rudimentary forms of evolution. This is true, for instance, of the analyses of Eastern village communities, of forms of property or of domestic organization by European writers of the last quarter of the

[2] Goldenweiser: *Early Civilization*, p. 25; also Hahn: *Demeter und Baubo.*
[3] Cf. Steinmetz: *Classification of Social Types.*

nineteenth century. The achievements of the West in democracy and industrialism developed in particular a certain bias, which led to the characterization of the social organizations of the immature races as preëconomic, communal, gentile, theocratic, etc.

Social Phenomena Now Studied Inductively.—In all the social and humanistic sciences the partiality for the one-straight-line evolution fitted well with the prevailing habit of deductive analysis and the aversion from the inductive and genetic study of ethnographical data. On the other hand, the contrast between the old mythical rationalism and modern behaviorism as furnishing the foundations of the analysis of social behavior represents also a marked difference in the tendencies which govern the social sciences. From the idea of social evolution as following a single pattern we have now turned definitely to the more accurate biological idea of divergent and multilinear evolution in different regions.[4]

Regional Classification of Social Types.—The scientific classification of social, like that of biological, types must now be related to ecology, which traces the relations of the activities of organisms to their environment. From Ibn Khaldun down to Ellsworth Huntington, through Montesquieu, Buckle and Ratzel, the geographical view of sociology has won for itself a well-established place in social thought.

Unfortunately this view has as yet remained a mere ab-

[4] A remarkable anticipation of scientific method is illustrated by Seal's paper on "The Physical Basis of Race," incorporated in Spiller: *Inter-Racial Problems.* Seal has produced no great dogmatic treatise, but his monographs, though few in number, are extraordinarily rich in suggestion and inspiration.

straction in the minds of political philosophers, economists, etc., and for this reason has not molded their hypotheses or organized the collection of their materials. And yet the increasing application of biological methods to the field of social life and evolution, which implies above all the concept of institutions as the outcome of man's adaptation to his environment, demands a revision of classification of social forms, which touches the essentials of sociology. This precludes a partial or sectional analysis of human life and forms of society, influenced as these are by conditions which differ by their quality, quantity and order of succession. It also condemns as partial any judgment of their worth derived from thought and experience as a member of a particular society under the influence of its own scheme of values, although this is now the prevalent treatment in all the social and humanistic sciences. Thus Seeley, who proposed to coördinate political science with natural history, cautioned us that an inductive method of political science must begin by putting aside as irrelevant the distinction of inferior and superior and by admitting to impartial consideration all societies held together by the principle of government. "We must distinguish and arrange the various kinds of the state in the same purely observant spirit which a Linnæus brought to plants or a Cuvier to animals. We no longer think of excluding any state because we do not like it, any more than a naturalist would have a right to exclude plants under the contemptuous name of 'weeds,' or animals under the name of 'vermin.' " The treatment of politics according to the methods of natural history has, however, been abandoned. Sidgwick remarked that political science seeks to arrange the forms of political

society in classes, or to exhibit them as examples of types, but he confined his treatment to "the principal forms of political society which the history of European civilization manifests, and which possesses what may be called a morphological unity." He continued: "If we try to begin at the beginning, as seems natural, we have to begin in almost utter darkness." This darkness is being dispelled by our increasing acquisition of anthropological and ethnographic data, but we see no sign yet of improvement of the method of political science, notwithstanding the promising start made in the systematization of political science by means of biological criteria which we owe to Bagehot and Seeley. In my "Democracies of the East: A Study in Comparative Politics," I have attempted to prove the past and present existence in the East of forms of political organization which cannot by any means be ranged in a serial order with the forms of government of the West. These can be interpreted only when we apply to the state the idea of the variations of species, and conceive of political development as proceeding on divergent lines in adaptation to the geographical and historical conditions and factors.[5]

Insularity of European Economics.—In economics also the suggestions of biology have failed to bear any fruit as regards supplying criteria for the classification of economic institutions. Bagehot laid down certain postulates of political economy which he deduced from the economic organization of Occidental civilization, outside the pale of which, he frankly contended, society is uneconomic or pre-economic. This was the prevailing attitude of classical or neo-classical economics which regarded economic forces as

[5] Cf. Ford: *The Natural History of the State*, p. 169.

approximating a norm or working their way to a position of equilibrium. Any tendencies that did not fit in with the existing institutions of Western industrial society, idealized as something "normal," fixed, or "definitive," were labeled as obstacles and causes of economic friction. Thus customs, which embody the living fabric of human and social values, always have been interpreted as something extraneous to man. They are regarded as dykes or barriers, which deflect normal economic functioning, the standard of which is set by limited personal observation and a species of introspection, and the hyper-rationalizing business psychology associated with the contemporary phase of Western industrial history. Agricultural history, which would have given one the widest possible knowledge of and sympathy with men in all phases of his existence and all stages of his civilization, has received inadequate attention. Even for the historical school of economics the norm and type of evolution are furnished by the social history of Western Europe, chiefly the phase known as industrialism; all economic forms and institutions which do not conform to it are regarded as uneconomic and extra-economic. It is true that historical economics protested against the universality of economic laws. Knies perceived that this perpetuality was the brother of the immutability of the old Zoölogy and the new school set before itself the task of deducing historical stages and laws of economic evolution. But the historical idea did not go far enough. The history of farming and social organization was neglected. The epochs in agricultural history and the transformations in social economy received little or no attention, while the study of the different agricultural systems was left mainly to ethnolo-

gists, who labeled the traces of collectivism "German," "Slav" or "Celtic" and made individualism "Latin." It is true that the rural economy of Europe for the greater part of the last thousand years is comprehended within the structure known as the feudal system; but there have been many particular variations due to the social history of different countries, and the system has been, at any moment, at different stages of evolution in different countries. The present position of agriculture is, of course, a heritage from the past. But rural life in the past is studied chiefly from the point of view of the ethnologist and the constitutional historian, and less from that of the economist. This has been so particularly in England where, when the farming methods and agrarian organization were proving unsuitable, the people turned to sheep-raising, which change was a starting-point towards her modern career and her further industrial development. But, even in the most industrialized countries, such as England, the economic life of a town or a city cannot be understood without reference to the lands which send it food and raw materials, and the villages from which it attracts men and women. The agricultural development of India, China, Japan or Siberia brings to light features which do not fit in with the categories of Western European economic history. These, therefore, have been labeled as archaic or uneconomic and left outside the field of interpretation. Economic evolution is interpreted chiefly from the measure of progress attained in the nineteenth century and not only the farming and land settlement of medieval Europe but also the types of agricultural development of various other peoples and countries have hardly any meaning for historical economics.

Need for a Genetic Sociology.—Not merely is economic history pursued with a narrow sectional outlook, but there is no adequate recognition of the interrelation of phases of development, economic, social or political, the interweaving of the social process. Anthropology, ethnology, rural economics, etc., the sciences mediating between biology and civilization, on the one hand; and sociology, on the other, stand poles asunder. Such specialized studies have no doubt advanced a great deal, but they have not been linked together by a rigid, genetic and comparative method with a central inquiry into the genesis and stages of social evolution as a whole. It is this lack of coördination in the social sciences which accounts for the fact that there has been no agreement as to the criteria to be applied in determining the stages of social evolution. Ethnologists like Brinton and Ratzel, economic historians like List and Bucher, sociologists like Spencer and Giddings, have used quite different standards. Human geography with its distinctive geographical realms, physical anthropology with its permanent anatomical types, ethnology with its zones of ethnic culture, technology with its stick, stone, bronze and iron ages, economic history with its hunting, pastoral, agricultural and manufacturing stages, the philosophy of history with its law of three or more stages of thought—it is time that all these should cease to pursue their specialisms disconnectedly. Their conflicting voices should be harmonized in a Genetic Sociology which will base its generalizations on the data gathered from all the sciences which cover society's evolutionary groundwork. But chief among such sciences will be a unified study of social activities in their relations to environmental factors of

every kind. Thus what ecology does for biological forms by explaining variations in animal and vegetable species (by reference to land elevation, humidity, temperature, amount of light, etc.), regional economics does for social types. Considering that from an evolutionary standpoint, as among social activities, it is experience of conditions ruling the acquisition of food materials, the arts of production and other economic factors which so far governs the history of civilization, we will find that economic history (ecologic succession) supplies us with a main clue to the classification of stages of social evolution, and that even the making of flint implements is less valuable in this respect than the knowledge of the various processes by means of which man has extracted a living from the soil.[6] There are, of course, other factors which enter into regional succession, and which will be more and more dominant as there is greater control over the region as the direct result of man's activities.

Economic and Cultural Phases.—Genetic Sociology exhibits in the main the reaction of the economic method on the successive phases of culture in particular regions. There is to be found a correlation of stages of economic development with the evolution of social values and usages, and, indeed, the economic, the religious and the social norms are related to one another in their sequence and coexistence. But conquest and migration play an important part in economic evolution. Looking back to the broadly marked stages of early civilization, we find that primitive economy consists of collecting the needs of the group directly from the regional sources. Under this system, a large area will

[6] Vide Carver: *Selected Readings in Rural Economics*, Introduction.

support only a relatively small population. The next stage appeared when man became a herder. As flocks multiply, and the steppes or prairies fail to support him, the herdsman reverts to the old huntsman type. He brings together a standing force which is nomadic like the herdsman's flocks, but which, under his leadership, acquired in the intervening stage, sweeps over and ultimately holds in awe the tribute-giving settled population of the plains. Superiority of advantages raised some herdsmen, as the mounted nomads, to a high level, the combined results of rapid movement and conflict leading to riches, the institution of a slave class, surplus production, and trade.[7] The emergence of slavery or serfdom, the social domination of the military class and ethnical segregation were the costs paid by society for the building up of a strong central law-making authority and the "security of life and property." Military authority increased with every increase of territory which brought more peasants and more revenues. But the development of the arts of production and variety of consumption led to the suppression of the essential needs of a peasant community by the requirements of trade, which alone could satisfy the luxurious feudal lord. Money economy led at first to the disruption of compact village communities, and created large estates, but ultimately broke up the feudal overlordship. The class of landless laborers, however, which emerged with the system of money exchanges, perpetuated and intensified conquest for plunder and exploitation. The booty which first the trader and squatter and then the conquistador bring to the country allays the ire of revolution by giving food and wages to the

[7] Gras: *Introduction to Economic History.*

proletariat. At the same time their rough methods have led often to wholesale extermination of many a thoroughbred stock in tropical and subtropical regions, where the conqueror or capitalist still plays the rôle of the hunter, though he has acquired the shepherd's will and capacity to control, and the trader's desire and ability to increase and accumulate wealth. Man has a social memory and he carries forward his new task with the accumulated experience of his past social evolution. The hunter of the local forest, who has lorded it over the shepherd and exacted tribute from and finally expelled the peasant from his own holding, has now broken down local, national or regional barriers, and, armed with the skill and appliances of the artisans and mechanics of the city and the power that the trader's wealth can give or buy, has become the cosmopolitan robber-conqueror who is no longer content to live, but insists on living luxuriously on the bounty of the tropical and subtropical realms. For, obviously, through social maladaptation, the temperate regions fail to satisfy the needs of their own peoples. Thus we find the planter taking recourse in these regions to the most wasteful method of soil utilization, viz., the one-crop system, thereby reviving the earliest collectional economy, which can maintain only a very small population. The camera of economic-social history, exhibiting the successive phases of economic development in each of the sections of a valley, expands into a world picture, but the order of development is reversed, the hunter being its overlord to whom the peasant, the shepherd and often the trader yield allegiance. On land or sea the herdsman or the viking has created a suitable culture-medium for the state by developing class feeling and segre-

gation based on domination; and, just as the land-state grows by fresh conquest of lands and populations, the maritime state which comes into being from piracy and trade extends itself through these two means.

Types of Social Development.—But social forms are a result of many things besides conquest, which is regarded by many sociologists as the keynote of the social or even the economic process. There are, in the first place, limits of conquest. The mountain system, desert and ocean serve as physical barriers. In great plains inhabited by dense populations, conquest is difficult, especially where there is geographical isolation and authority rests on persuasion. There is no social subjugation. The civilization runs on an even course undisturbed by political vicissitudes and the foreign conqueror finds nothing *solid* and is often at the mercy of historic accidents which ruin his ephemeral empire. The ethnology and land tenure of Eastern countries having a large settled population show the one-sided character of the generalizations that the State had always its origin in the contract between the conquerors and the conquered, or that the beginnings of industrial division of labor were to be sought in the subjection of ethnic groups by the dominating group.

History of the Village.—Thus among large sections of the human race we find at an early stage the autonomous village. It is a closely-knit kinship group, generally an organized stronghold, which does not owe any allegiance to any chief or noble, but is held together at first by totemistic regulations and then by the customs of family groups, clans or tribes. The village retains its self-management and self-sufficiency, and its unity and initiative are strengthened by

common defense or common vendetta, common land or water, or participation in the common lands. Adoption of strangers and *servi* adds another characteristic social tie which marks the transformation of the kinship into the neighborhood group. The village attracts its own artisans and functionaries, each occupying his own place. Each is given an allotment of land or shares of grain, and performs his characteristic duty as a member of the agricultural community. The community maintains its own police to protect life and property from the aggression of hostile and jealous neighbors. Since it assimilates strangers and outsiders, its organic and functional solidarity is independent of barriers of tribe, clan or family group or caste, gaining ample support from coöperative habits in agriculture, industry and social life. The holding of land in common by the village community, which superseded older tribal bonds, itself yields place to family and individual ownership, though collective management of wastes and meadows may still be retained. The waste land is a common pasture of the cattle of the village; its external boundaries are carefully marked and retained as a common right of the village, or rather township, to the exclusion of others. The early appearance of the village state springs from the necessity of maintaining irrigation channels, tanks, reservoirs and embankments. Adjoining villages combine in the same way as tribal aggregations. There are unions of five, seven or a hundred villages, and their vigor and the resistance they have opposed to those who, in every age and region, have attempted to encroach upon their autonomy, have depended upon particular political conditions and circumstances. The state here is oriented by gradual accretion and integration.

Division of labor here establishes itself among an ethnically heterogeneous group in a process of peaceful assimilation. Agricultural classes and industrial communities pursue their objects without any contacts between a dominating group and a subject population. Social stratification becomes the result of a gradual upward economic differentiation, and the social hierarchy in the main corresponds to the steps of economic advance, the forester and the shepherd standing lowest, the artisans and peasants in the middle, the traders and landlords, tribal chiefs and priests at the top of the socio-economic scale. All this reproduces in the life of a single community the whole course of cultural development.

Transformation of Belief.—The social organization often remains elastic enough to admit unrelated men of the lower orders. At first the social mixing with these is avoided through taboos of impurity and untouchability, though they are gradually utilized as watch and ward, artisans and servants of the village groups. Thus the hunter and the shepherd sooner or later find a place in the social system of the peasant, and a predominantly hunting religion develops or is suddenly converted into a predominantly pastoral or agricultural religion. The forest spirits, boundary gods, or clan deities of the forest where the village clearing was made are superseded gradually by household and village gods as well as ancestral deities. The godlings which preside over human and cattle diseases come to wield a greater sway than the sun or the moon, or the spirits of the earth and forest. The ritual of blood sacrifice is superseded by the cult of human fertility: instead of a human sacrifice to the earth goddess in the forests, we see the dance of

youths and maidens in the fields whenever sowing time comes around. In hoe-culture, sowing time was associated with various magical rites and orgiastic dances, intended to influence the sprouting and growth of the seeds. With the introduction of the plough, the harvest time is awaited with greater anxiety. Wundt observes: "The plough trains to reflection and brooding; the hoe stirs violent emotions." Thus we have prayers of the priests to ancestors for protection and aid, and prolonged fasts and other sanctification rites in the period of tense waiting for the rain. Gradually these cults cease to be regarded as purely magical in nature but behind the offering of first crops and fruits to household and other deities magical elements are discernible. The marriage bond replaces tribal promiscuity, but the custom may survive of marriage with the parent-tree of the original village grove, where village children formerly were begotten at seasonal feasts; or, again, there are retained the periodical fight and the tribal dance, accompanied by the older license. Similarly, the joint reclamation of the unclaimed forest, and even periodical reallotment, the common dormitory for the unmarried young, the participation in field-labor and in birth, marriage and death ceremonies, or, again, the tribal hunting or pastoral ceremonies, remain vital survivals of a stage of social development long outgrown. The village assembly still sits under the shade of the village tree, and there are images near-by of the guardian deities of the village, as well as of the boundary snake which encircles the village limits, in whose presence the periodical redistributions of land formerly were made, and in whose name oaths still may be taken in village land disputes. Common descent from gods or

saints, which formerly superseded relationship of totem, is itself replaced by the connection of village or neighborhood. The periodical ceremonies and festivals in the village temple replace the older communal feasts, and these now serve as binders of the village community. The reorientation of traditions, beliefs and values, whether sudden or gradual, thus accompanies every step of economic advance, and leaves its indelible marks behind. Comparative ethnology shows that the supersession of totem by eponym, of unstable sex relationships by monogamy, of forest deities and boundary godlings by household and village gods, of communal feasts by village festivals, of communal holding of land by individual property rights, is often brought about by a forward step in economic evolution which thus marks a gradual transformation all along the line.

The Regional Evolution of Society.—Step by step, with the economic activity, all other activities are oriented, and the task of Historical Sociology is to find out the evolution and gradation of social values and to isolate or group accordingly, as best as it can, the distinctive features of each characteristic region or stage of development. Thus Comparative Sociology will broaden into Historical Sociology even as the morphology and physiology of animal and vegetable forms expand into the study of the general laws of organic evolution. But this is possible only when the divergent and peculiar lines of evolution of every distinctive region which involves some special conditions are carefully studied and then compared one with another. Systematization at this stage is apt to be void of content and barren of results. Science needs observation and hard toil

in special fields, leading up to genuine synthetic and co-operative work within an ordered plan. Then will sociology be revivified at its sources, renewed in its methods and harmonized in its subjects.

INDEX

D

E

F

G

H

I

N

BY THE SAME AUTHOR

THE FOUNDATIONS OF INDIAN ECONOMICS

The Saturday Review.—"Mr. Mukerjee states the situation with lucid clearness. Mr. Mukerjee has laid his finger upon a social and economic weakness which is well-known in this land. He has indicated a method of dealing with it which may be applicable in England, but which certainly is worth considering by all who are interested in the fortunes of our citizens in India."

The Manchester Guardian.—"A great deal of hard work and much sincere thinking has gone to the making of the book."

The Nation (New York).—"Most illuminating is the careful description and illustration of the various hereditary trades and their process of production and distribution."

The Mysore University Magazine.—"The book is excellently and most creditably written and gives evidence of a vast range of knowledge."

DEMOCRACIES OF THE EAST

The Times.—"This study in comparative politics contains a learned but simple and always lively examination of the roots of organic communal life in the East, with special reference to India and China. . . . A valuable history of local institutions."

The Glasgow Herald.—". . . Its subject is really the contribution which the East may make to the science of government and the lessons which may be drawn from the actual social organisation there existing, and the author conceives that these lessons may be specially valuable at a time when the Western theory of the State seems in process of disintegration. . . . A notable contribution to the comprehension of Indian history, Professor Mukerjee's excellent study is also a valuable sociological examination which demands the attention of Western readers."

New Standards.—"The book is addressed primarily to specialists and to Indian administrators, but should also be of interest to Guildsmen who wish to study the political implications of their own creed. It supplies a bracing corrective to the view that the *laissez faire* economics with which India has been indoctrinated for the last sixty years have practically westernised the country."

Economica.—"Professor Mukerjee has performed a real service by producing this deeply interesting study of the political mind of the East."

The Sociological Review.—"Professor Mukerjee, whose previous writings on the regional treatment of Indian economics and cognate subjects have already made him familiar to students of sociology, has now produced a thought-provoking and informative volume. . . . Mr. Mukerjee describes his book as a study in comparative politics, but its true bearings are even more comprehensive. While essentially an elaboration of the now familiar formula, Folk-Work-Place, Mukerjee's scheme of political formalism offers some obvious analogies to that of the Guild socialists."

PRINCIPLES OF COMPARATIVE ECONOMICS

Journal of the Indian Economic Society.—"It is refreshing to find how Prof. Mukerjee tries to fructify economics and raise it to a sounder level by application of the comprehensive sociological method to economic theory and practice. The book is a welcome and timely addition to the literature of Economics, showing how the Economic branch of Social science will bear fruit only if it draws its sap from Sociology, and adopts the methods of dealing with complex social causation, developed by Comte, Spencer, Le Play, Ward and other sociologists and social psychologists. . . . We heartily recommend the book to all interested in sound development of economic method and doctrine."

Hindustan Review.—"There is plenty in the book that will cause many a searching in the heart of the orthodox Economist, and perhaps make him revise some of his accepted theories. It is a book of first rate ability and is bound to place Dr. Mukerjee in the front rank of constructive thinkers."

The Englishman, Calcutta.—"The author of this excellent treatise on comparative economics is one of the few really distinguished students of economic science in India. He has effected a very remarkable synthesis of the different branches of economic and social science, setting an example which is certain to be followed."

New Statesman.—"This is the most substantial and, it may be said, also the best written treatise on economics that has yet been produced by a native of India. . . . Dr. Mukerjee has not followed the scheme of a treatise on the 'principles of Economics,' which has for a century or more been traditional in Great Britain. He has written an original and stimulating book, which will be read in India, and which ought to be considered by British economists. . . . An interesting and elaborate economic treatise rich in first-hand information."

Cambridge Review.—"Prof. Mukerjee has written a book full of suggestive ideas that provoke thinking. . . . In the second topic which the author treats, he is brilliant and at his best. Herein he emphasises the new idea of Regional Economics. Differences in wants and habits due to geographic and other causes must change economic organisation, and our treatment of the laws underlying it. . . . The book is written in good style."

The Courant, Edinburgh.—"Original research combined with philosophic insight into economic problems have gone to the production of a work which is bound to take a high place in economic literature and to exercise wide influence in advancing economic studies along new and fruitful lines of investigation."

Pioneer Allahabad.—"Professor Radhakamal Mukerjee is one of the borderland workers. He has read widely in biology, in psychology, and in sociology; and his tendency of thought is to link the science of economics with those and other subjects with which it has obvious relations . . . the work by its sociological method of treatment, is a real and solid contribution to economic science. It is very necessary that such books with a broad outlook and wide field should be written and read."

Freeman, New York.—". . . he gives us in this book much solid information concerning a social-economic order that is very little known in Western countries."

The American Political Science Review.—"This differs from the usual works on economics in the emphasis laid on the study of regional factors and on relativity in economic theory."

GROUNDWORK OF ECONOMICS

The Statesman.—"Dr. Mukerjee has his own interpretation of the place of economics in the sciences, and links it up with much else to give a picture not so much of principles at work but of men and women at work because of principles. This is one of a very few good books which can serve as an introduction to the study of economic considerations as manifested in the Indian social and industrial organisation. It is vivid, readable, human. The book is a valuable source of information on Indian customs and conditions, and we have no doubt that it will be widely quoted in future discussions. We strongly recommend all who want to understand their environment to read the book. It is well written, packed with information, and has a few appropriate illustrations; it is the work of a man who has a head for economics and a heart for men and women."